# Review of Speech-Language Services for Children and Youth in Alberta: A Literature Review

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# Executive Summary

Based on recommendations arising from a 2003 review of Alberta's Student Health Initiative, a provincial review of speech-language services was initiated by a Working Committee comprised of representatives from four Alberta Ministries: Children's Services, Community Development, Health and Wellness, and Learning. The Working Committee requested a literature review to be undertaken to inform the activities and strategies being developed as part of the speech-language services review.

## General information

A median prevalence of 6% is reported for children with primary speech or language delays in the general population of children up to 16 years of age (Law et al 1998). Speech and language delays and disorders have negative effects on school achievement and can be associated with social, emotional and behavioural problems (Law, Garrett & Nye 2003). Teachers believe students benefit from speech-language pathology (SLP) services in ways that benefit classroom performance, including positive impacts on literacy, written language skills, socialization and following classroom routines (Schooling 2003).

## Options for school-based SLP services

A classification of service delivery models is suggested based on the American Speech-Language Hearing Association (ASHA 2000) guidelines for the roles and responsibilities of sppech-language pathologists (SLPs):

- Collaborative/consultation – the SLP does not provide direct services
- Classroom-based or integrated services – is curriculum based; team teaching is frequently used with this model
- Pull-out – services provided individually or in small groups, in separate room or within the classroom
- Self-contained program – the SLP is the classroom teacher responsible for curriculum and SLP remediation
- Community-based – services provided in the home or community setting
- Monitoring – often used before discharge/exit from therapy
- Combination – e.g., individual pullout services and works with child in classroom

A general trend in the literature from the traditional pullout services to more collaborative and integrated models was noted. In the United Kingdom and the United States, this trend is generally associated with legislative changes towards "inclusion" where children with disabilities are educated alongside non-disabled children and all children have the right to access quality services. A second noted trend is towards increased accountability. The latter trend is often associated with managed care (HMO) models in the United States and Local Education Authority/Health Trusts collaborations in the United Kingdom.

The evidence of effectiveness of the various models was noted as follows:

- There is evidence that classroom-based intervention is effective when compared with no treatment (i.e., regular classroom instruction).
- Evidence for pull-out models are represented by the general SLP literature. There is strong evidence that SLP interventions are effective for children with expressive phonological and expressive vocabulary difficulties. There is less evidence of effectiveness for receptive language difficulties and the evidence is mixed for children with expressive syntax difficulties (Law, Garrett & Nye, 2003).
- Studies with the strongest designs suggest that both classroom-based and traditional pull-out models are equally effective for children with expressive language delays/disorders. One study suggested

that when combined, the classroom-based and pull-out models are more effective than either model used independently.

- Within the pull-out model, studies generally report no difference in the effectiveness of individual versus group therapy (Law, Garrett and Nye 2003).

Surveys of practice patterns suggest that Canadian SLPs mostly use either consultative (indirect) or traditional pull-out models (direct individual or group treatment) over SLP/teacher collaborative models. When classroom-based interventions are used, there is a preference to use those models involving the least collaborative interventions.

Both SLPs and teachers believe that it is important to work together regarding communication skills of children (Wright & Kersner 1999) and a large majority of both teachers and SLPs perceive that the collaborative process influences them (Hartas 2004). The main barrier to collaboration is reported to be time constraints. Other barriers noted are role uncertainty, turf and relationship issues, and geographical, logistical and programming considerations.

### Role/involvement of others

Considerable research attention has focused on the effectiveness of parents as alternate service providers.

- There is strong evidence that trained parents are as effective as SLPs in achieving language improvements (Law, Garrett & Nye 2003). However, the results of treatment are more varied for parents, suggesting that some parents are better suited than others.
- There is less evidence of the effectiveness of parent-administered articulation therapy as an alternative to clinician-administered SLP. However, there is some evidence that articulation therapy is most effective when individual SLP is combined with a home program (Fudala, England & Ganoung 1972; Schooling 2003).
- Results of economic analyses are mixed, with some authors reporting that the cost-effectiveness of clinician and parent-administered SLP when the value of parental time is excluded. When parental time is included, home parent training programs may cost up to 20% more than clinic-based programs (Eiserman, Weber & McCoun 1995). A second study found that when all costs were included, a home-based program was more efficient (Barnett, Escobar & Ravsten 1988).

Surprisingly little research on the effectiveness of paraprofessionals as alternative providers was found. Professional SLP associations in Canada, United Kingdom and the United States have position papers, guidelines or standards governing the use of paraprofessionals. Generally, these standards or guidelines specify the qualifications, training, role and level of supervision required by paraprofessionals. SLPs who use paraprofessionals are positive about having this resource (Peters-Johnson 1996). However, several issues have been reported, including SLP concerns related to job security, lack of preparation to assume legal liability and supervisory responsibilities, increased workload and compromised service quality.

### Special Issues

SLP professional associations in Canada, United Kingdom and United States have recognized and prepared position papers on the issue of SLP for children who are linguistically and culturally diverse. Three themes were noted in the literature: insufficient numbers of multi-cultural and/or bilingual SLPs, insufficient education of SLPs to work with these students, and lack of or inappropriate use of standardized assessment instruments for languages other than English.

A second topic area receiving attention in the literature is the transition of students through various placements from home to preschool, kindergarten, school and post-secondary school. As well, articles on the transition from self-contained language units to mainstream school placement were identified. While articles generally reflected informed opinion rather than evidence, most authors writing on

transitions stressed the need for formal and collaborative mechanisms to assist children with disabilities through their transitions.

### Caseload Management

The main questions SLPs must address in managing their caseloads, given greater demand for the service than they can readily supply, are how to allocate their services most effectively, efficiently and fairly, and what alternative means of service delivery are viable, especially in remote geographical areas.

There is some literature that suggests differences in client access to SLP services in rural versus urban areas, due to travel distances for either SLPs or clients. One study noted that access barriers are more likely to result in greater use of home programs and consultative (indirect) services to schools, and greater use of the telephone as a bridge between therapy sessions.

Caseload guidelines (i.e., 40 for school-aged children; 25 for preschoolers) suggested by the American Speech-Language-Hearing Association (ASHA), are routinely exceeded in Canada and the United States, where school-based SLPs report mean caseload sizes of 60 and 53 respectively. Teachers' perceptions of the effectiveness of traditional pull-out SLP on reading, writing and following classroom routines is reduced as SLP caseload size increases. Little is known about caseload size as it relates to the more recent service models such as indirect treatment and SLP/teacher collaboration.

One author describes the tension between the perspectives of health and education sectors with respect to caseload selection and prioritization decisions. In the education sector, where the perspective is towards 'inclusion', prioritization of students based on resource constraints is not acceptable. The health sector, on the other hand, views prioritization based on need as an essential component of caseload and resource management. In fact, under the National Health Service Trust system in the United Kingdom, audits are conducted to ensure students are not unnecessarily and inappropriately subjected to treatment.

No research specifically on the effectiveness of various SLP scheduling options, including block scheduling, was identified. Some authors who have studied frequency, intensity and length of treatment suggest that there may be an optimal length of treatment, with some suggesting this may fall between four and 12 weeks. Treatment beyond this time period, while not ineffective, may result in smaller effect size.

While evidence is limited, there is cautious optimism regarding the use of telehealth and computer technology in SLP.

# Introduction

## Background

In 2003, Alberta's Ministers of Learning, Health and Wellness and Children's Services requested a review of the Student Health Initiative service delivery model. As a result of two of the review recommendations, a provincial review of speech-language services was initiated in December 2003 by a Working Committee comprised of representatives from four Ministries: Children's Services, Community Development, Health and Wellness, and Learning. An Advisory Committee of stakeholders has been established to provide expertise, advice and input to the Working Committee on identified issues and recommendations.

The Working Committee requested a literature review to be undertaken to inform the activities and strategies being developed as part of the speech-language services review. The results of the literature review will contribute to a recommended strategic approach to the delivery of speech-language pathology (SLP) services in Alberta.

## Purpose

The objective of the literature review was to examine the strengths and issues related to speech and language pathology services delivered to preschool and school-aged children. The specific aspects addressed were:

1. What SLP service delivery models are considered to be effective?

2. What aspects of service delivery models for SLP services are considered to be effective? The following model considerations were of interest:

    - Direct SLP versus consultative approaches to service delivery
    - Multi-disciplinary versus single disciplinary service delivery
    - Group versus individual therapy
    - Use of paraprofessionals (i.e., SLP assistants, teaching assistants)
    - Role/involvement of teachers
    - Role/involvement of parents/guardians (family)
    - Caseload size
    - Caseload selection and prioritization
    - Discharge or therapy discontinuation criteria
    - Types of scheduling models (e.g., block, frequency of contact, duration)
    - Governance (school versus health system based system)
    - Collaboration between health and education
    - Transitions
    - Access
    - Technology

## Methodology

The literature review methodology is presented in Appendix A.

A systematic library search, undertaken with the assistance of an AHW librarian and research assistant, accessed the following databases: CINAHL, EMBASE, ERIC, Ovid MEDLINE and PsychINFO. Searches were limited to English language articles from 1994 to present and the preschool and school age categories. Articles on services to adults and to infants were excluded.

In addition to the library search, a search was undertaken of health technology assessment websites web-based databases as well as websites of national professional SLP organizations in Alberta, Canada, Australia, United Kingdom and the United States. The latter web search was undertaken to identify policy or position statements related to the subject categories.

Articles retrieved from the search were screened to determine their relevance to the current project. All those deemed relevant were reviewed and categorized into three major groupings: informed opinion, study and systematic reviews/meta analyses. Study articles were further categorized into descriptive versus comparative, and were reviewed with consideration to the strength of the study design. Articles representing the strongest evidence in each subject category were retained and are reported in this paper. Relevant methodologically sound comparative studies reported in the systematic reviews/meta-analyses but not previously identified in this project's literature search were requested. This resulted in the inclusion of a limited number of pre-1994 articles as they were judged of sufficient importance to the project.

All articles retrieved by October 29, 2004 were reviewed for relevancy and considered for inclusion.

## Organization of report

The remainder of the body of this report presents the findings of the literature review, organized into the following sections: general information, school-based SLP service delivery models, role/involvement of others, special issues and caseload management.

The reader is directed to Appendix A for a detail of the review methodology. A table of comparative studies on the topic of service models is presented in Appendix B, and a full bibliography of all relevant articles identified is listed in Appendix C.

# General information

A median prevalence of 5.95% is reported for children with primary speech or language delays in the general population of children up to 16 years of age.[1] Law et al (1998) found that estimates vary from 0.6% to 33.2%, based on differences in study parameters including the extent to which speech and language delays were combined, the nature of the population and the definition used to define delay. The results of prevalence studies for speech delays only range from 2.3% to 24.6% in children between 5 and 14 years of age. In studies of children between 3 and 7 years, the prevalence of only receptive language delays range between 2.63% and 3.95%, and only expressive language delays ranged from 2.34% to 4.27%. The author noted that "there is little published evidence to support the perception that

[1] Law, J., Boyle, J., Harris, F., Harkness, A. and Nye, C. (July 1998). Screening for speech and language delay: a systematic review of the literature. *Health Technology Assessment*, 2(9).

either the total number of children with language delay declines in real terms across the age range, or that prevalence has been rising over recent years" (p.vii)

Primary delays are those where speech and language skills are delayed relative to other skills, usually in the absence of a known underlying cause. Secondary delays, which were excluded from Law's review of prevalence estimates, refer to cases in which speech and language skills are delayed to the same extent as other skills, often due to known causes or associated with other conditions such as learning disability, hearing loss, autism, cerebral palsy and cleft palate.

Speech language pathologists sometimes distinguish between the term "delay" and "disorder" with the latter referring to cases which do not follow normal development patterns, although this distinction is less frequently evident in the more recent literature. Other authors use the more general term "impairment" and may refer to the World Health Organization (WHO) 1980 international classification of impairment, disability and handicap or WHO's later classifications relating to functioning, disabilities and health.[2,3]

Speech impairments are generally categorized as:

- Articulation (physical movements of mouth and throat involved in making speech sounds) or phonology (speech sounds and combinations of sounds);
- Fluency (stuttering or stammering); or
- Voice (characteristics and volume of sound produced through physical movement of the vocal folds and respiration).

Language impairments may be categorized into receptive (language comprehension or understanding), or expressive (language production) problems. Aspects of language include syntax (grammatical structures), morphology (aspect of grammar dealing with components of words), semantics (meaning of words or phrases) and pragmatics (context of language and use of language in social situations).

A systematic review of SLP services for children with primary speech or language delay or disorder concluded that such communication problems can have considerable negative effects on school achievement and can be associated with social, emotional and behavioral problems.[4] When untreated, 65% of expressive language problems identified in children at age 3 were found to persist to age four, and 38% persisted to age seven. Regardless of whether the expressive language delays were resolved or not, authors of the systematic review found that "between 41% and 75% of early expressive language-delayed children showed reading problems at 8 years of age" (p. 21).

Articulation errors may be more likely to resolve naturally than language problems, although there is some evidence to suggest that "underlying language difficulties may continue for children originally identified as having a speech delay" and that there may be an impact on literacy skills even after speech problems are resolved (p. 20).

A systematic review of randomized controlled trials of SLP interventions for children or adolescents concluded that SLP is effective for children with expressive phonological and expressive vocabulary difficulties.[5] There is less evidence of effectiveness for receptive language difficulties and the evidence is mixed for children with expressive syntax difficulties.

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[2] Law, J., Boyle, J., Harris, F., Harkness, A. and Nye, C. (July 1998). Screening for speech and language delay: a systematic review of the literature. *Health Technology Assessment*, 2(9)

[3] American Speech-Language-Hearing Association (Ad Hoc Committee). (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, III, 249-311.

[4] Law, J., Garrett, Z. and Nye, C. (2004). *Speech and language therapy interventions for children with primary speech and language delay or disorder.* Cochrane Database of Systematic Reviews, 2. Updated 29-May-2003. Retrieved September 16, 2004 from http://gateway.ut.ovid.com/gw1/ovideb.cgi

[5] Ibid.

Results from a large survey[6] of primary teachers for children served by SLPs in the United States suggests that teachers believe students benefit from SLP services in ways that benefit classroom performance, including positive impacts on literacy, written language skills, socialization and following classroom routines.

# Service delivery models

In the past three decades, reforms in education and health care have been instrumental in shaping the service delivery model available to children with speech and language disorders. These reforms are evident in legislation, government policy and professional organizations. Blosser and Kratcostki[7] describe the evolution of the speech-language pathologists' role as follows:

- 1970's – specialist model
- 1980's – expert model
- 1990's – collaborative-consultative model
- 2000's – facilitator of service delivery.

In the education field, the concept of inclusion has stimulated the development of service delivery models that consider the unique needs of each child. At present, inclusive models of service delivery are in the forefront in an attempt to meet each child's needs in the least restrictive environment. In the health care environment, focus on managed care and financial responsibility have led to awareness of outcomes, quality and efficacy.

## Options for school-based services

A classification of options for service delivery is suggested by the American Speech-Language Hearing Association[8] (ASHA) as follows:

- Collaborative consultation – the SLP, teacher and parents work together in an educational environment, but the SLP does not provide direct service.
- Classroom-based – also known as integrated services, inter- or trans-disciplinary or inclusive programming, this option involves the SLP providing direct services to students in the classroom or other environments. Team teaching is frequently used with this model
- Pull-out – services are provided individually or in small groups, either in a separate room or within the classroom.
- Self-contained program – the SLP is the classroom teacher responsible for both curriculum teaching and SLP therapy.
- Community-based – SLP services are provided in the home or community setting.
- Monitoring – the SLP sees the student for a certain time during the grading period to check on speech and language skills. This model is often used before discharge/dismissal from therapy.
- Combination – two or more of the above options are provided. For example, the SLP works with the student in the classroom and provides individual or small group pullout services.

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[6] Schooling, T. (2003). Lessons from the National Outcomes Measurement System (NOMS). *Seminars in Speech and Language, 24(3)*. 245 – 256.

[7] Blosser, J. L. & Kratcoski, A. (1997 April). PACs: A Framework for Determining Appropriate Service Delivery Options. *Language, Speech and Hearing Services in Schools, 28*, 99-107.

[8] American Speech-Language-Hearing Association (Ad Hoc Committee). (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, III, 249-311.

In recent years, the area of classroom-based or integrated services has received increased attention. In 1992, Friend[9] proposed a classification system to further delineate the role of the SLP and teacher in an integrated classroom setting. The system has been adapted by Elksnin and Capilouto[10] as follows:

- One teaches, one observes;
- One teaches, one "drifts" – the person drifting helps students with their work;
- Station teaching – instructional content is divided into two parts; students switch instruction from teacher and SLP;
- Parallel teaching – the group is split in half; the teacher and SLP teach the same objective to each group;
- Remedial teaching – one teaches students who have mastered material; while the other reteaches those who have not mastered the material;
- Supplemental teaching – one presents the lesson while the other adopts lesson for those requiring assistance; and
- Team teaching - both the SLP and teacher present lesson to all students.

## Trends and legislative influences

Two general trends, associated with legislative influences, were identified in the literature review. These are reported under the headings: inclusion and accountability. While the trends were described in the United Kingdom and United States research, the effects of the trends were also reflected in the Canadian literature.

### Inclusion

In 1994, the United Nations Education, Scientific and Cultural Organization (UNESCO) held a world conference which resulted in the Salamanca Statement which encouraged countries to "adopt as a matter of law or policy the principle of inclusive education, enrolling all children in regular schools, unless there are compelling reasons for doing otherwise" [11] (p. 1).

Legislation addressing inclusion has stimulated a general trend from the traditional pullout services to more collaborative and integrated models. This is evident in the United Kingdom and United States, where legislative changes have promoted or encouraged:

- Integration of school SLP services into the rest of the child's educational program.
- Inclusion (education of children with disabilities with nondisabled children and the right of all children to access quality services).
- Curriculum based assessment and treatment, including Individualized Education Programs (IEPs).

In the United Kingdom, the following legislation in education has supported the concept of inclusion.

- *Education Act* 1993, 1996. The 1993 Act contained the initial principle that children with special educational needs should be educated in mainstream schools, if desired by the parents.[12]

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[9] Friend, M. (1992) *Visionary leadership for today's schools*. Paper presented at International Council for Learning Disabilities meeting. In Elksnin, L.K., and Capilouto, G.J. (1994). Speech-language pathologists' perceptions of integrated service delivery in school settings. *Language, Speech, and Hearing Services in Schools*, 25, 258-267.

[10] Elksnin, L.K., and Capilouto, G.J. (1994). Speech-Language Pathologists' Perceptions of Integrated Service Delivery in School Settings. *Language, Speech, and Hearing Services in Schools*, 25, 258-267.

[11] Taken from Inclusive Schooling Children with Special Educational Needs website on 2004 Nov 05. www.redbridgeschools.net/inclusion/code_of_practice_links.htm

[12] Ibid.

- *Special Educational Needs and Disability Act* (SENDA) 2001. SENDA amended the Disability Discrimination Act which gave people with disabilities the right to employment, property, education and use of transport,[13] and strengthened the child's right to inclusion within mainstream schooling. At the same time, it strengthened the right to a special education, if so desired by the parents ...[and] "imposes new duties on LEAs and schools not to discriminate against pupils with disabilities and to plan to increase access to schools for disabled pupils"[14] (p.1).
- *Special Educational Needs (SEN) Code of Practice* 2001. The SEN Code of Practice has undergone revisions since its original 1994 version. This document "provides a framework for developing the strong partnerships between parents, schools, local education authorities, health and social services and voluntary organisations that are crucial to success in removing barriers to participation and learning" [15] (p. i).
- *Inclusive Schooling - Children with Special Educational Needs* 2001. This document provides statutory guidance to schools and local education authorities on the operation of the inclusion framework.

In the United States, the legislative and policy changes noted to be influential were:

- *Education for All Handicapped Children Act* (1975). According to this Act, all children with disabilities have access to "free, appropriate public education that emphasizes special education and related services designed to meet their unique needs"[16] (p. 69). This Act was amended in 1986 to ensure services for children from birth through age 2, emphasizing need for early intervention.
- *Regular Education Initiative*. In the 1980's, the Office of Special Education and Rehabilitation Services called for a partnership between general and special education in order to avoid barriers to children involved in pull-out treatment.
- *Americans with Disabilities Act* (1990) "mandated reasonable accommodations for disabilities across all public and private settings, including private and public schools"[17] (p. 69).
- *Individuals with Disabilities Education Act* (IDEA). This Act, introduced in 1990, emerged from the *Education for All Handicapped Children Act*. Amendments were made in 1997 and 1999. Key requirements of this Act include:
    - FAPE: free, appropriate public education.
    - Individualized education program (IEP) with related services and due process procedures.
    - Entitlement from ages 3 to 21.
    - Designated assistive technology as a related service in IEPs.
    - Greater inclusion in community schools (least restrictive placement).
    - Funding for infant and toddler early intervention programs.
    - By age 16, every student to have explicitly written in the IEP a plan for transition to employment or post secondary education.[18]

  This legislation promoted the integration of school SLP services into the rest of the child's educational program and reinforced the use of curriculum-based assessment and treatment

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[13] Taken from Teachernet website: www.teachernet.gov.uk/management/resourcesfinanceandbuildi.../SENandDisabilities on 2004 Nov 05.

[14] Taken on 2004 Nov 05 from www.teachernet.gov.uk/management/resourcesfinanceand buildi.../SENandDisabilities.

[15] Taken from Special Educational Needs Code of Practice website on 2004 Nov 05. www.redbridgeschools.net/inclusion/code_of_practice_links.htm.

[16] Whitmire, K. (2002). The Evolution of School-Based Speech-Language Services: A half century of change and a new century of practice. *Communication Disorders Quarterly, 23(2)*, 68-76.

[17] Ibid.

[18] Retrieved from on October 27, 2004 from Law and exception students website: www.unc.edu/~ahowell/exceplaw.html.

(Whitmore 2002, Eger 2000 reported in Whitmore). "Transition services were added to facilitate a student's movement from school to post-school activities"[19] (p. 69).

The American Speech-Language-Hearing Association's 1996 position paper on Inclusive Practices[20] states that:

> "The inclusive-practices philosophy emphasizes serving children and youths in the least restrictive environment that meets their needs optimally. Inclusive practices consist of a range of service-delivery options that need not be mutually exclusive. They can include direct, classroom-based, community-based, and consultative intervention programming. Inclusive practices are based on a commitment to selecting and designing interventions that meet the needs of each child and family." (p. 35)

## Accountability

A second trend noted in legislation and policy is towards increased accountability, outcomes, efficacy and evidence-based practice. This trend is often associated with governance issues, particularly the managed care (HMO) models in the United States and Local Education Authority and Health Trusts/Primary Care Trusts collaborations in the United Kingdom.[21] [22] [23] One author states that the concept of managed care, noted for controlling service utilization and focusing on outcomes and accountability, is directing SLPs to focus move towards outcome-based practice whereby they are involved in determining the appropriate length of treatment for specific disorders and demonstrating cost-benefit.[24]

In the United States, the 2002 *No Child Left Behind Act (NCLBA)* called for increased accountability, evidence-based practice and greater flexibility for state spending.[25] According to Schooling, the accountability requirements contained this Act imply that SLPs will now need to "prove to administrators, lawmakers and taxpayers the value and benefit of treatment in schools and how such treatment plays a role in the student's development, academic achievement and ability to meet higher standards[26] (p. 246).

In response to the need for treatment outcome data, ASHA developed the National Outcomes Measurement System (NOMS) "as a means to determine the outcomes and effectiveness associated with school-based speech and language services. NOMS collects information about student demographics, clinician caseload size, service delivery characteristics, and functional improvement"[27] (p. 246).

In the United Kingdom, there has been an ongoing debate whether speech and language treatment should be an educational or non-educational provision. In 1972, the Committee of Inquiry into Speech Therapy Services (Quirk Report, 1972) recommended SLP services be unified, with therapists no longer employed by both education and health.[28] In 1974, SLP services became the responsibility of the National Health Services (NHS). A landmark court ruling in 1989 (Lancaster judgment) ruled that for the majority of children speech therapy was an educational provision. This resulted in a paradox in the law; that is, "where a health authority (legal provider) could not provide speech therapy, the education

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[19] Whitmire, K. (2002). The evolution of school-based speech-language services: a half century of change and a new century of practice. *Communication Disorders Quarterly, 23(2)*, 68-76.

[20] American Speech-Language-Hearing Association. (1996 Spring). *Inclusive Practices for Children and Youths with Communication Disorders* (Position Statement and Technical Report). ASHA, 38, 35-44.

[21] Blosser, J. L. & Kratcoski, A. (1997 April). PACs: A framework for determining appropriate service delivery options. Language, Speech and Hearing Services in Schools, 28, 99-107.

[22] Lindsay, G. S. et al (2002). Speech and language therapy services to education in England and Wales. Journal of Communication Disorders, 37(3), 273-288.

[23] O'Brien, M. A. & Huffman, N. P. (1998). Impact of managed care in the schools. *Language, Speech and Hearing Services in Schools, 29*, 263-269.

[24] Schooling, T. (2003). Lessons from the National Outcomes Measurement System (NOMS). *Seminars in Speech and Language, 24(3)*. 245-256.

[25] Ibid.

[26] Ibid.

[27] Ibid.

[28] Miller, C. (1994). Speech and language therapy: confusion in the Code. *British Journal of Education, 21(2)*, 53 – 55.

authority was obliged to do so if therapy was written in a child's statement of special educational need"[29] (p.54); however, no increase in funding was made to education authorities.

In the 1990's, health services in the United Kingdom were re-organized. District health authorities and fundholding general practitioners purchase services from NHS Trusts (now called Primary Care Trusts).[30] [31] As part of their mandate, the district health authorities are required to plan for the therapy needs in the education sector. SLPs are employed by the National Health Service (NHS) Trusts and provide services to the purchasers – the district health authorities.

## Evidence of Effectiveness

While the literature contains considerable research on the effectiveness of traditional SLP service models, there has been less effort directed to the more recent models for school-based services. No comparative studies were found on the self-contained program model where the SLP is the classroom teacher. One relatively weak study was identified for the interactive consultation model. Several articles on classroom-based interventions were identified, included a few with relatively sound methodologies. Classroom-based service delivery involves the SLP providing services within the classroom or other natural environments.[32]

The studies of the effectiveness of school-based SLP service models are classified for the purpose of this review according to the type of intervention studied:

- Interactive consultation (no control).
- Classroom-based versus no treatment.
- Pull-out – individual versus group treatment.
- Classroom-based versus traditional pull-out.
- Combination classroom/pull-out model versus classroom (SLP or teacher independent) versus traditional pull-out.

### Interactive consultation

One relatively weak single-subject (no control) study with a pre-post design attempted to determine the effectiveness of a consultative model.[33] The study involved six children with primary phonological disorders and the teachers who had referred them to SLP. Teachers received a two day initial training workshop, followed by three half day workshops (2-4 hours) at three week intervals and a final half day workshop after a six week break. Results on three outcome measures showed improvement at the end of the program when compared to baseline scores; however, the gains for one of these outcome measures, percent of consonants correct, were not maintained over time as indicated by follow-up testing. The authors reflect that "the results of the teacher training program were disappointing given the amount of time spent training teachers and assessing children (estimated conservatively at 100 hours). The cost efficacy of this particular program could be judged as lower than...programs using parents as agents" (p. 40).

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[29] Miller, C. (1994). Speech and language therapy: confusion in the Code. *British Journal of Education, 21(2)*. 53 – 55.

[30] Ibid.

[31] Lindsay, G., Soloff, N., Law, J., Band, S., Peacey, N., Gascoigne, M. and Radford, J. (January-March 2003). Speech and language therapy services to education in England and Wales. *International Journal of Language & Communication Disorders, 38(1)*, 117.

[32] American Speech-Language-Hearing Association (Ad Hoc Committee). (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, III, 249-311.

[33] Dodd, B. and Barker, R. (June 1990). The efficacy of utilizing parents and teachers as agents of therapy for children with phonological disorders. *Australian Journal of Human Communication Disorders*, 18(1), 29-45.

### Classroom-based versus no treatment

Two studies[34] [35] found that classroom-based service delivery is effective when compared to a no treatment control group. In both studies, classroom-based service delivery involved collaboration between the SLP and teacher, and the experimental groups consisted of entire classrooms of students.

- Hadley et al[36] compared vocabulary and phonological awareness of inner-city kindergarten and Grade 1 students randomly assigned to a collaborative SLP-teacher classroom based model versus a control group (regular/no SLP classroom-based service). The collaborative service delivery model consisted of SLPs and teachers involved in professional education, joint curriculum planning, and vocabulary and phonological awareness instruction. The SLP provided classroom-based instruction for 2.5 days/week. After a 6-month period, students in the collaborative classrooms scored significantly higher in the area of receptive and expressive vocabulary. Significant improvement was also noted in phonological awareness tasks such as beginning sound awareness and letter-sound associations although no differences were noted for rhyme tasks. In the experimental group significant improvement was also noted for syllable deletion awareness even though this task was not specifically targeted, suggesting a generalization effect.

- Farber and Klein[37] described a randomized control study that compared 12 classrooms of kindergarten and Gr. 1 students enrolled in a classroom-based intervention program with a control group. The specific intervention program evaluated was entitled "Maximizing Academic Growth by Improving Communication" (MAGIC), which involved direct, collaborative SLP and teacher classroom intervention on seven areas of language, provided 3 times a week (2.25 hours) for an entire school year. Outcome measures of language abilities indicated that in comparison to the control group, students in MAGIC classrooms had significantly higher scores in the areas of listening, writing and ability to understand vocabulary and cognitive-linguistic concepts.

Both of these studies provide evidence for the effectiveness of classroom-based intervention that involved SLP-teacher collaboration for improving language abilities and some phonological skills (i.e., sound awareness, letter-sound associations) in kindergarten and Grade 1 students. Hadley et al also showed evidence of generalization. Details of classroom-based intervention vary in terms of amount of SLP time in the classroom, time in collaborative planning, related professional educational activities, and length of intervention. Due to these variations, the specific aspects of the study should be consulted.

### Pull-out – individual versus group treatment

The term "pull-out" to describe direct individual or small group SLP interventions is a relatively new term. Research reflecting this model is represented in the traditional SLP body of literature and was not labeled as pull-out at the time of the studies. As discussed previously, SLP has been found to be effective, and generally this evidence pertains to direct individual or small group SLP intervention – or a pull-out model.

A systematic review conducted by Law, Garrett and Nye[38] revealed that, generally, studies report no difference in the effectiveness of individual versus group therapy. One study involving a database of 6,000 preschool children found that in the preschool population, when amount of treatment is held

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[34] Hadley, P., Simmerman, A., Long, M., & Luna, M. (2000 July). Facilitating language development for inner-city children: experimental evaluation of a collaborative, classroom-based intervention. *Language, Speech, and Hearing Services in Schools, 31*, 280-295.

[35] Farber, J. G. and Klein, E. R. (1999). Classroom-based assessment of a collaborative intervention program with kindergarten and first-grade students. *Language, Speech and Hearing Services in Schools*, 30, 83-91.

[36] Hadley, P., Simmerman, A., Long, M., & Luna, M. (2000 July). Facilitating language development for inner-city children: experimental evaluation of a collaborative, classroom-based intervention. *Language, Speech, and Hearing Services in Schools, 31*, 280-295.

[37] Farber, J. G. and Klein, E. R. (1999). Classroom-based assessment of a collaborative intervention program with kindergarten and first-grade students. *Language, Speech and Hearing Services in Schools*, 30, 83-91.

constant, individual treatment is noted to result in a greater percent of children demonstrating improvement in articulation skills.[39] As the amount of treatment hours increases, the likelihood of benefit increases. For example, 71% of children receiving between 2.1 and 10 hours of individual treatment demonstrated functional improvement compared with 59% of children receiving group therapy. When the treatment time is between 20.1 and 40 hours, the percent demonstrating improvement is increased to 91% for individual compared with 50% in group therapy. However, when children are treated for articulation in conjunction with language therapy, there appears to be no difference in individual versus group therapy on articulation outcomes

### Classroom-based versus traditional pull-out

Two randomized controlled studies[40] [41] suggested that both classroom-based and traditional pull-out models are equally effective for children with expressive language delays/disorders. One study with a weaker design found little difference between the two models.

- Valdez & Montgomery[42] identified 40 African American Head Start children (3-5 years) and randomly assigned them to language "concept" intervention using consultation/collaboration (inclusion) model versus a pull-out treatment model. Children received treatment for 90 minutes per week for a six month period. Results revealed "no significant clinical differences between the inclusion group and the pull-out group in total language scores, receptive language scores and expressive language scores" (p. 67). The authors noted superior results in receptive language gains in the individual pullout treatment group when compared with the classroom intervention group.

- Wilcox, Kouri and Caswell[43] conducted a control study in which 20 children (20-47 months) were randomly assigned to either individual or classroom conditions for lexical training. Children received 45-minute individual sessions or morning classroom (9:00-12:00) intervention twice weekly for 12-16 weeks. Results revealed no significant differences in use of target words for children in individual versus classroom intervention. The authors found significantly superior generalization of expressive language gains to the home setting for children in the classroom-based model, as children made greater use of target words in the home.

- Bland and Prelock,[44] using a matched control pre-post design, found little difference in language production between the groups receiving language discourse intervention in classroom-based versus pull-out conditions. Statistically significant differences were found in utterance completion and intelligibility over time, in favour of the classroom-based intervention group. The effectiveness of classroom-based intervention was compared to pull-out therapy for students with difficulties in the area of connected discourse. The experimental group received classroom intervention for 30-45 min/week, in-service training, and planning meetings (2-4/month). After a three-year period, students who received classroom-based intervention demonstrated significant improvement on measures of intelligible/complete utterance and fewer incomplete/unintelligible utterances; however "there were few differences noted in syntax, semantics or morphology for

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[39] Law, J., Garrett, Z. and Nye, C. (2004). *Speech and language therapy interventions for children with primary speech and language delay or disorder.* Cochrane Database of Systematic Reviews, 2. Updated 29-May-2003. Retrieved September 16, 2004 from http://gateway.ut.ovid.com/gw1/ovideb.cgi

[39] Schooling, T. (2003). Lessons from the National Outcomes Measurement System (NOMS). *Seminars in Speech and Language, 24(3).* 245-256.

[40] Valdez, F. M. and Montgomery, J. K. (1997). Outcomes from two treatment approaches for children with communication disorders in Head Start. *Journal of Children's Communication Development, 18 (2),* 65-71.

[41] Wilcox, M. J., Kouri, T. A. & Caswell, S. B. (1991). Early language intervention: a comparison of classroom and individual treatment. *American Journal of Speech/Language Pathology, 1(1),* 49-62.

[42] Valdez, F. M. and Montgomery, J. K. (1997). Outcomes from two treatment approaches for children with communication disorders in Head Start. *Journal of Children's Communication Development, 18 (2),* 65-71.

[43] Wilcox, M. J., Kouri, T. A. & Caswell, S. B. (1991). Early language intervention: a comparison of classroom and individual treatment. *American Journal of Speech/Language Pathology, 1(1),* 49-62.

[44] Bland, L. E. & Prelock, P. A. (1996). Effects of collaboration on language performance. *Journal of Children's Communication Development,* 17(2), 31-37.

students served in a collaborative model as compared to students served in a pull-out model" (p.31). The authors noted that small sample size may limit the generalizability of these results.

### Combination model

Throneburg et al[45] examined the effect of a combination service delivery model on students with and without any speech and language deficit. This well designed quasi-experimental study found a model involving SLP and teacher collaboration, team teaching and selected 15 min/week pullout services was more effective for teaching curricular vocabulary than either a classroom-based (SLP – teacher independent) model or a traditional pullout model. The gains were similar for the independent classroom-based and pullout models. All three groups made gains when pre- and post-test scores were compared; however the combination group made the greatest gains after 12 weeks of intervention.

The results suggest that for students with speech and language deficits, vocabulary instruction is more effective in a classroom-based intervention that involved collaboration as compared to a classroom-based intervention without collaboration or a traditional pull-out model.

Interestingly, vocabulary test gains for children who did not qualify for SLP services were significantly higher for the two classroom models with SLP involvement over the pullout model in which the "no-treatment" students were exposed only to vocabulary teaching provided by the teacher. This finding suggests that exposure to SLP teaching in the classroom may be beneficial not only to those needing SLP but also for students without speech and language deficits.

## Practice – what models are used?

### Canada

Information on the type of service delivery models used in school-based settings in Canada is available from two surveys:

- A 2003 survey[46] of 275 SLPs working with school-aged children revealed that a large majority (81%) of therapists used more than one service model and, on average, three different models. The proportion of survey respondents reporting use of model were:
    - 85% "worked in a consultative model in which they determined the intervention targets, procedures and contexts, but relied on another … to carry out the program" (p. 18);
    - 83% used direct individual therapy;
    - 65% provided direct group therapy; and
    - 55% reported using a collaborative model involving teachers, parents, volunteers or other personnel.

  Sixty two percent of these SLPs reported satisfaction with the service model they are using. This was less than the satisfaction reported by SLPs serving predominantly younger children (70%) or adults (78%).

- In a 1996 survey of 253 school-based SLPs, Dohan and Schultz[47] looked at the reported use of seven service delivery approaches for classroom intervention, ranging from least collaborative

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[45] Throneburg, R. N. et al (2000). A comparison of service delivery models: effects on curricular vocabulary skills in the school setting. *American Journal of Speech-Language Pathology, 9*, 10-20.

[46] Vision Research. (2003 December). *2003 Caseload Guidelines Survey Final Report for Speech-Language Pathology*. Prepared for Canadian Association of Speech-Language Pathologists and Audiologists.

[47] Dohan, M. & Schulz, H. (1998). The speech-language pathologist's changing role: collaboration within the classroom. *Journal of Children's Communication Development*, 20(1), 9-18.

(Approach 1) to most collaborative (Approach 7). The seven approaches were adapted from Elksnin and Capilouto's classification (based on Friend's 1992 work) of classroom-based interventions described earlier under Options for School-based Services (pp. 4-5 of this paper).

Use of Approach 1 was reported by 76% of SLPs; use of Approach 2 by 63%; and use of Approaches 3 to 7, ranged from 19% to 34%. Seventy three percent of respondents reported they provided interventions in classrooms, with a mean percent of their time in the classroom reported at 22%. SLPs were noted to "most often use classroom-based approaches that require a lesser degree of collaboration with teachers, such as observation of students and assisting students with their work... They much less frequently use approaches that require a greater degree of collaboration", such as team teaching" (p.15).

Use of a classroom model and level of collaboration varied by type of disorder, with the most collaborative approaches being employed more frequently for language disorders than for articulation, fluency or voice disorders. Use of the classroom-based model was also noted to diminish with grade level.

The two surveys suggest that Canadian SLPs mostly use either consultative (indirect) or traditional pull-out models (direct individual or group treatment) over collaborative service models. When classroom-based interventions are used, there is a preference to use those involving the least collaborative interventions.

### Other countries

Two studies from the United Kingdom and one from the United States reported the results of surveys to determine extent and/or type of collaborative work between SLPs and teachers:

- A 1997 survey of 191 school-based SLPs[48] found that 35% reported joint assessments with teachers, 47% reported joint planning and 56% reported joint intervention.
- Fletcher[49] conducted a survey of 15 teachers and 6 SLPs in four language units in Scotland to determine the extent of collaboration and type of collaborative relationship. The percent of respondents who reported frequent (>50% of the time) collaboration in the following activities was as follows: 33% assessment, 76% planning, 43% teaching, 52% language work, 52% evaluation and 48% reporting.
- Pershey and Rapking[50] conducted a survey of SLPs providing services within an urban school district in the United States, which was comprised primarily of minority students (67.4%). The 17 SLPs responding to the survey served a collective caseload of 1206 students. Of these, the majority were served in a non-classroom setting using a pull-out model involving small group (54.8%) or individual (11.5%) therapy. Twenty nine percent were seen in special education classes, and 5% were seen in their regular classroom.

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[48] Wright, J. A. & Graham, J. (1997). Where and when to speech and language therapists work with teachers? *British Journal of Special Education, 24 (4)*, 171 – 174.

[49] Fletcher, M. (1998). Collaboration in Glasgow's primary school language units. *International Journal of Language & Communication Disorders, 33*, 575-580.

[50] Pershey, M. G. and Rapking, C. I. (2003). A survey of collaborative speech-language service delivery under large caseload conditions in an Urban school district in the United States. *Journal of Speech-Language Pathology and Audiology, 27(4)*, 211-220.

## Perceptions and attitudes

No studies and limited articles were found that directly discussed and compared the perceived value of the various service delivery options. The reviewers found one article that outlined the draw-backs of the pull-out model and a number of descriptive studies that explored SLP and/or teacher perceptions and attitudes regarding collaborative efforts.

### Pull-out

Harn, Bradshaw and Ogletree[51] list the criticisms of the pull-out model:

- "It represents a fragmented rather than an integrated approach to service delivery. In contrast to a holistic view of a child, it encourages an emphasis upon discrete skills, with little attention to integration of skills.
- There is often little carryover of skills acquired in therapy to other contexts (e.g., the classroom).
- Being pulled out of class can be a source of considerable social embarrassment for children, particularly as they reach adolescence" (p. 165).

### SLP/teacher collaboration

Generally, surveys of SLPs and teachers suggest positive attitudes towards collaborative service delivery. In their survey of teachers and SLPs working in 83 special schools in England, Wright and Kersner[52] found that all teachers and SLPs believed it is important for the teacher and therapist to work together regarding the communication skills of children. Wright and Graham[53] note that inter-professional collaboration "promotes a holistic approach to meeting the child's needs" (p. 173) whereby the child can reach his or her maximum potential.

In the United Kingdom, Hartas[54] conducted a survey and held group discussions with 25 teachers and 17 SLPs in a special school for children with language difficulties and autistic spectrum disorders. The purpose of the descriptive study was to investigate perceptions regarding factors that facilitate or hinder collaboration. The author found that 94% of SLPs and 90% of teachers perceive that the collaborative process influences them at an individual level, client level and professional level. "Both teachers and SLTs consistently believe that they have made:

- Professional changes (e.g., modifying work practices and daily activities);
- Personal changes (e.g., developing flexible problem-solving skills, expanding negotiation skills, advocacy and self-advocacy skills, counselling);
- Social changes (e.g., forming new channels of communication, creating opportunities for social interaction); and
- Philosophical changes (e.g., ideology and beliefs regarding inclusion and individual differences" (pp. 45-46).

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[51] Harn, W.E., Bradshaw, M.L. and Ogletree, B.T. (1999). The speech-language pathologist in the schools: changing roles. *Intervention in School and Clinic, 34(3)*, 163-9.

[52] Wright, J.A. and Kersner, M. (December 1999). Teachers and speech and language therapist working with children with physical disabilities: implications for inclusive education. *British Journal of Special Education, 26(4)*, 201-5.

[53] Wright, J. A. and Graham, J. (1997). Where and when do speech and language therapists work with teachers? *British Journal of Special Education, 24(4)*, 171-4.

[54] Hartas, D. (2004). Teacher and speech-language therapist collaboration: being equal and achieving a common goal? *Child Language Teaching and Therapy*, 20(1) 33-54.

Hartas suggests a concept of "reciprocal consultation" where SLPs-teacher collaboration is conceptualized as a "series of co-equal interactions with common goals and shared values"[55] (pp 48-49).

The results of two descriptive studies found that classroom-based intervention resulted in an improved awareness of communication difficulties and confidence in teacher referrals to SLP services.[56] [57]

Three descriptive survey studies, described below, suggest the most important barriers to SLP and teacher collaboration are time constraints. Other themes included role uncertainty, turfism, relationship issues, and geographical, logistical and programming considerations.

- Wright and Kersner[58] conducted a survey of 83 special schools for children with physical disabilities. Results indicated that approximately 23% of teachers and 30% of SLPs perceive disadvantages to working together.

  When asked if there were factors that made collaborative effort difficult, 97 of 109 (89%) teachers and therapists answered in the affirmative. The following barriers were noted:

  - Time constraints (reported by 84 of 97), including limited time to meet, plan and prepare feedback to each other, to experiment, to teach new skills, to observe and to listen; limited mutual availability, limited dedicated timetable time;
  - Limited time spent by SLP in the school (9 of 97);
  - Excessive SLP caseloads (reported by 5 teachers); and
  - Differing priorities (4 of 97).

- Pershey and Rapking[59] noted the following barriers in their survey of 17 SLPs:

  - Time constraints (large caseloads, too many school buildings – travel time, too many meetings, lack of co-planning time, short stays within buildings);
  - Limited knowledge of instructional routines of other disciplines (i.e., SLPs had little preparation for literacy teaching, teachers were unaware of SLPS roles/potential roles or of scheduling benefits possible with in-class services); and
  - Inflexibility and dysfunctional interpersonal relationships (traditionalism, SLPs not welcome in classes, SLPs uninterested in collaboration, inefficient, need for empirical evidence of value of collaborative services).

- In his survey and group discussions, Hartas[60] found that "most teachers and SLTs see time commitment/constraints and rigid organizational structures as being the hindering factors in their collaborative workings with others" (p.33). Specific barriers or hindering factors included: lack of time, limited communication, professional status/hierarchies, lack of equality, lack of interdisciplinary culture, clash of paradigms and terminology, and lack of formal systems to support collaboration (p. 47).

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[55] Hartas, D. (2004). Teacher and speech-language therapist collaboration: being equal and achieving a common goal? *Child Language Teaching and Therapy*, 20(1), 33-54.

[56] Wren, Y., Roulstone, S., Parkhouse, J. and Hall, B. (2001). A model for a mainstream school-based speech and language therapy service. *Child Language Teaching and Therapy, 17(2)*, 107-26.

[57] Cleary, P. and McFadden S. (2002). Helping children with difficulties in the classroom. *International Journal of Language and Communication Disorders*, 36 (supplemental), 104-9.

[58] Wright, J. A. and Kersner, M. (1999). Teachers and speech and language therapists working with children with physical disabilities: Implications for inclusive education. *British Journal of Special Education, 26(4)*, 201-5.

[59] Pershey, M. G. and Rapking, C. I. (2003). A survey of collaborative speech-language service delivery under large caseload conditions in an urban school district in the United States. *Journal of Speech-Language Pathology and Audiology, 27(4)*, 211-20.

[60] Hartas, D. (2004). Teacher and speech-language therapist collaboration: being equal and achieving a common goal? *Child Language Teaching and Therapy*, 33-54.

In the same study, Hartas suggested that willingness to make professional changes and learn from each other, individual contribution, and shared beliefs and values were factors that support SLP/teacher collaboration[61] (p. 33).

# Role and involvement of others

In the previous section the role of SLPs in the school system and their involvement with teachers was presented. In this section, the role and involvement of parents/family and paraprofessionals in the delivery of SLP services is discussed. Not all of the studies focus on school-based services; however, the reviewers believe the information is relevant for SLPs serving the school system.

## Parents/family

The use of parents in speech and language intervention has been investigated in terms effectiveness and efficiency. This aspect of the literature search yielded the most number of well-designed studies. Overall, the effectiveness of parent-assisted language treatment is well supported. Results are less clear for articulation and phonological treatment. Mixed results on the economic efficiency of parental interventions were evident.

### Effectiveness of parents as alternate providers of language treatment

Seven comparative studies were identified on the effectiveness of parents as alternate treatment providers. There is strong evidence that trained parents are as effective as SLPs in achieving expressive language improvements in pre-school aged children., as demonstrated by the following studies:

- Gibbard[62] compared outcomes for 10 two and three year old children receiving parent-based intervention in the area of expressive language skills with those of 20 children comprising a no intervention control group. Mothers attended bi-weekly group language training sessions provided by a SLP over a six month period. Results showed significant improvement in expressive language skills in the intervention group as compared to the control group.

- In a second follow-up study, Gibbard[63] compared the effectiveness of the parental language training approach with direct individual therapy administered by an SLP. In addition to the two treatment groups comprised of eight children each, a third control group was formed comprising of eight children whose parents received non-specific training on general learning skills rather than on language. Results of this study indicated that children in the direct SLP and parent-based intervention approaches made significantly greater improvement as compared to the control group, and that parents who received group language training were at least as effective as SLPs across a range of measures. The authors of this study also concluded that improvement made through parental treatment cannot be explained by the Hawthorne effect (i.e., exposure to general training).

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[61] Hartas, D. (2004). Teacher and speech-language therapist collaboration: being equal and achieving a common goal? *Child Language Teaching and Therapy*, 33-54.

[62] Gibbard, D. (1994). Parental-based intervention with pre-school language-delayed children. *European Journal of Disorders of Communication, 29*, 131-150.

[63] Ibid. Gibbard, D.

- Fey et al[64] compared intervention approaches to facilitate grammar. In this study, 30 three to five year old children were randomly assigned to one of three groups: a SLP administered approach, a parent-based intervention in which parents had received SLP training, or a delayed treatment control group. Specific techniques used included focused stimulation procedures and a cyclical goal attack strategy. At the end of a 4½ month period, children in both treatment groups (i.e., SLP administered or parent-based) made significant improvement as compared to the control group which exhibited no gains. In a follow-up study involving a further five month intervention with 18 of the same subjects, Fey, Cleave and Long[65] noted greater and more consistent gains for the children treated by SLPs than by parents.

Three studies evaluating the Hanen Parent Program were reviewed. Each yielded significant results in terms of the effectiveness of parent-assisted treatment.

- In a pilot study of a program of focused stimulation for improving vocabulary, Girolametto, Pearce and Weitzman[66] randomly assigned 16 mothers and their 22-38 month old children to either a parent-intervention treatment group or a delayed treatment (control) group. The Hanen Parent Program consisted of seven group evening sessions and three individual parent sessions over a 10-week period. Results indicated that children in the parent-assisted intervention demonstrated significant improvement in the production of target words and use of symbolic gestures, as compared to controls. Children in the parent-assisted intervention also showed improvement in reduction of aggressive or destructive behaviour; however due to the measures used, the authors noted it was difficult to discern if this change was due to changes in parent expectations or actual child behaviour.

- In a second randomized controlled trial (RCT), Girolametto, Pearce and Weitzman[67] randomly assigned 25 toddlers and their parents to either an 11-week parent-administered intervention for expressive language (vocabulary and syntax) or a control group. Two outcomes were evaluated including expressive language and parent-child interaction. Results indicated children in the parent-intervention group demonstrated significant improvement in their vocabulary and syntax, and that trained mothers increased their use of targeted stimulation techniques in comparison to the control group. One limitation of this study is that parents were highly motivated and may not be reflective of all parents.

- In a non-randomized controlled study involving 20 families, McDade and McCartan[68] examined the effectiveness of the Hanen parent training program involving nine evening sessions and three home visits. Results indicated a significant increase in mother-child interactive engagement and a decrease of time spent in unitary engagement, as compared to the control group. Results indicated that "the experimental group showed a significant treatment effect... for both actual time and percentage of total time in interactive engagement whereas the control group remained virtually unchanged" (p. 559). In addition, the experimental group increased significantly on expressive language and total language scores as measured by the Preschool Language Scale.

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[64] Fey, M., Cleave, P., Long, S., and Hughes, D. (1993). Two Approaches to the facilitation of grammar in children with language impairment: an experimental evaluation. *Journal of Speech and Hearing Research, 36*, 141-157.

[65] Fey, M.E., Cleave, P.L. and Long, S.H. (February 1997). Two Models Of Grammar Facilitation In Children With Language Impairments: Phase 2. *Journal of Speech and Hearing Research, 40*, 5-19.

[66] Girolametto, L., Pearce, P. & Weitzman, E. (1996). The effects of focused stimulation for promoting vocabulary in young children with delays: a pilot study. *Journal of Children's Communication Development, 17(2)*, 39-49.

[67] Girolametto, L., Pearce, P.S. and Weitzman, E. (1996). Interactive focused stimulation for toddlers with expressive vocabulary delays. *Journal of Speech and Hearing Research, 39(6)*, 1274-83.

[68] McDade, A. and McCatran, P. (1998). 'Partnership with Parents' A Pilot Project. *International Journal of Language & Communication Disorders*, 33, Supplement.

## Effectiveness of parents as alternate providers in articulation/phonology and listening training

There is less evidence of the effectiveness of parent-administered articulation therapy as an alternative to SLP intervention than for parent-administered language treatment. The literature review yielded mixed findings.

- Law et al[69] summarizing a meta-analysis by Rosenthal (1994) stated that "results reveal effectiveness of direct and indirect approaches for expressive language and receptive language across both norm-referenced and criterion-referenced measures. However, only direct [SLP administered] treatment was effective in the case of articulation/phonology, though the small number of studies in this area and the use of non-standard treatment approaches in the indirect treatment conditions should be noted" (p.30).

- In a RCT, Lancaster[70] compared phonology treatment provided by SLPs versus parents with a control group over a six month intervention period. Parents receiving training on an 'input' approach described by Hodson and Paden (1983).[71] Results revealed significantly greater gains for children in the treatment group compared with controls and no significant difference between the progress of children in SLP versus parent groups.

- Dodd and Parker,[72] using a weaker single-subject pre-post design study, studied the effects of an 11 week parent training program on five children, aged two to four, who demonstrated deviant phonological development. Results revealed statistically significant improvements in the percent of consonants correctly produced at program end and upon follow-up when compared with baseline measurement.

- Shelton et al[73] conducted a RCT to compare the effects of parent administered listening, parent-administered reading-talking and a no-treatment control group and found "neither treatment group surpassed the control group in gains made on any auditory processing or articulatory measure" (p. 242).

Small sample size and characteristics of parents most likely to succeed are recurring themes in the systematic reviews of these analyses.

## Effectiveness of supplemental parental involvement and home programs

As demonstrated in the above studies, trained parents have been found to be effective as alternate treatment providers for young children with language delays/disorders and may, in some cases, be effective as alternate providers for articulation/phonology. However, the literature consistently suggests that the greatest potential benefit is achieved with a combined approach involving SLP providers supplemented by parental involvement.

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[69] Law, J., Boyle, J., Harris, F., Harkness, A. and Nye, C. (1998). Screening for speech and language delay: a systematic review of the literature. *Health Technology Assessment*, 2(9).

[70] Lancaster, G. (1991). *The Effectiveness of Parent Administered Input Training for Children with Phonological Disorders*. Unpublished MSc thesis, City University, London.

[71] Hodson, B. and Paden, E. (1983). Targeting intelligible speech: a phonological approach to remediation. Austin, Texas: Pro-Ed. In Law, J., Boyle, J., Harris, F., Harkness, A. and Nye, C. (July 1998). Screening for speech and language delay: a systematic review of the literature. *Health Technology Assessment*, 2(9).

[72] Dodd, B. and Barker, R. (1990). The efficacy of utilizing parents and teachers as agents of therapy for children with phonological disorders. *Australian Journal of Human Communication Disorders, 18(1)*, 29-45.

[73] Shelton, R.L., Johnson, A.F., Ruscello, D.M. and Arndt, W.B. (1978). Assessment of parent-administered listening training for preschool children with articulation deficits. *Journal of Speech and Hearing Disorders, 18*, 242-54.

- Fudala, England and Ganoung[74] conducted a RCT comparing outcomes of articulation treatment for 46 elementary school children whose parents were not asked to attend treatment sessions versus 46 children whose parents were invited to attend treatment sessions. This study indicated that children whose parents observed treatment sessions and were involved in home assignments made significantly greater improvement compared to children whose parents did not attend sessions.

- Schooling's[75] review of the National Outcome Measurement System (NOMS) database suggested that articulation therapy was most effective when individual therapy by a clinician totaling 10 hours or more was combined with a structured home program. "NOMS data shows how the investment of time in developing a structured home program affects articulation outcomes in preschoolers... 84% of the children who completed a structured home program as part of their treatment plan made functional improvement on their articulation skills [as compared to 64% children who improved with no home program]" (p. 250). Of the 84% who made improvement, 64% of these children achieved gains of two or more levels on the Articulation/Intelligibility Functional Communication Measures as compared to 24% of children who made this level of improvement with no home program. This author concludes that parental involvement in a structured home program is an important means of maximizing student outcomes.

Several authors note the positive responses of parents to their involvement in SLP:

- Grela and Illerbrun[76] conducted a parent satisfaction survey which evaluated satisfaction with services in rural Saskatchewan. Results indicated that 96% of parents "believed it was important that they work with their child at home during the intervention program... almost 87% believed that their child's chance for success in intervention programming was directly related to the degree of parental involvement ...75% were satisfied that they had been directly involved in the delivery of their child's therapy program" (p.209).

- McDade and McCartan[77] noted that parents involved in their parent program confirmed that "an increased knowledge of language and communication allowed them to focus on their child's strengths rather than their difficulties" (p. 560).

### Cost-effectiveness

The results of economic analyses on the effectiveness of indirect parent-assisted intervention are mixed:

- Eiserman, Weber and McCoun[78] conducted a comparative longitudinal study that evaluated the cost and outcomes of a home parent training intervention versus a clinic-based low parent involvement intervention. Authors conclude that "although no meaningful difference existed in the actual cost between the two approaches, when the value of parent time is included, it represents a very real cost of the intervention (i.e., the home parent training intervention may cost over 20% more than the clinic-based intervention)" (p. 40).

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[74] Fudala, J., England, G. and Ganoung, L. (1972). Out of the classroom: utilization of parents in a speech correction program. *Exceptional Children*, 407-12.

[75] Schooling, T. (2003). Lessons from the National Outcomes Measurement System (NOMS). *Seminars in Speech and Language, 24(3)*, 245-56.

[76] Grela, B.G. and Illerbrun, D. (1998). Evaluating rural preschool speech-language services: consumer satisfaction. *International Journal of Disability, Development and Education, 45(2)*, 203-16.

[77] McDade, A. and McCartan, P. (1998). 'Partnership with parents' a pilot project. *International Journal of Language & Communication Disorders*, 33, Supplement.

[78] Eiserman, W.D., Weber, C. and McCoun, M. (1995). Parent and professional roles in early intervention: a longitudinal comparison of the effects of two intervention configurations. *Journal of Special Education, 29(1)*, 20-44.

- Barnett, Escobar and Ravsten[79] used a RCT design to study the economic efficiency of (a) parent-delivered intervention, (b) center-based intervention, (c) both center- and home-based intervention and (d) no treatment. Cost analysis included all resources consumed, including those of parents and students. Home-based programming was determined to be most efficient, center-based intervention was more expensive and less effective, and the combination approach increased costs but did not significantly increase effectiveness.

- Support for the cost-effectiveness of parents is reported by Fey, Cleave, Long and Hughes[80] who noted that "for a group of 6 children, the clinician treatment required 240 hours of clinician time in direct contact and planning and preparation. In contrast, the parent treatment took 126 hours for a group of 6 children, only 53% of the time required for the clinician program" (p. 146).

## Paraprofessionals

For the purpose of this review, paraprofessionals are SLP support personnel possessing one of a number of job titles including teacher assistant or teacher aide, SLP or communication assistant/aide/associate or rehabilitation assistant/aide/associate. They may be hired to serve a single student through targeted funding or serve a number of students.

The literature review resulted in one study that investigated the effectiveness of paraprofessionals to support SLP and several descriptive surveys on the issue. The search uncovered a number of guidelines and reports issued by SLP professional organizations in Canada, United Kingdom and the United States.

### Professional guidelines, standards and reports

In July 1995, CASLPA issued a Position Paper on Support Personnel[81] in which the professional organization endorsed the supervised use of support personnel "as a means of enhancing the services provided by fully qualified professionals" and suggests their assistance may be sought to increase "the frequency, efficiency and/or availability of services" (p.2). The position paper specifies:

- The ultimate responsibility, legal and ethical, remains with the supervising clinician;
- Consumers must be informed by a qualified clinician when services will be provided by the support personnel;
- Certain activities should not be delegated, including interpretation of test results; choice, modification or termination of assessment tool, treatment procedure and goals; consultation/communication with referral sources; initial contact with student; assessment or intervention activities posing high risk or requiring continuous judgment; discharge planning and reporting.
- The necessity of on-the-job training for support personnel;
- Adequate preparation of SLPs to supervise support personnel; and
- Need for registered SLPs to be available at all times to direct, support and consult with support personnel.

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[79] Barnett, W.S., Escobar, C.M. and Ravsten, M.T. (1988). Parent and clinic early intervention for children with language handicaps: a cost-effective analysis. *Journal of Division for Early Childhood, 12(4)*, 290-8.

[80] Fey, M., Cleave, P., Long, S., & Hughes, D. (1993). Two approaches to the facilitation of grammar in children with language impairment: an experimental evaluation. *Journal of Speech and Hearing Research, 36*, 141-57.

[81] Canadian Association of Speech-Language Pathologists and Audiologists. (1995 July). *CASLPA Position Paper on Support Personnel in Speech-Language Pathology and Audiology*. Retrieved October 19, 2004 from www.caslpa.ca/english/resources/support.asp

Presently CASLPA is compiling results of a questionnaire on support personnel. This work is in preparation for the inclusion of SLP support staff as a membership category.[82]

In 1999, the Speech, Language and Hearing Association of Alberta (SHAA) issued guidelines for the use of support personnel[83] with an intent to "address the procedures, training, roles, proficiencies, and responsibilities in relation to the use of Speech-Language Pathologist Assistants" (p.1). Specific areas outlined in this document include: qualifications; training; proficiencies; role of support personnel; role of SLP; role of SLP's employer; and role of SHAA.

In the United Kingdom, the Royal College of Speech and Language Therapists (RCSLT) has Standards for Working with Speech and Language Therapy Support Practitioners.[84] Standards are developed in four areas including: clinical effectiveness/evidence-based practice; risk management; professional user and client/carer involvement; and education and lifelong learning. The standards framework "can be used to assist in the development of local policies around the training and employment of SLT support practitioners. These policies should be in place to ensure the delivery of high quality services and standards of practice"[85] (p.2).

In 1997, ASHA and two other organizations in the United States sponsored seven organizations "to develop a framework for the appropriate preparation, use, and supervision of paraprofessionals in the delivery of speech and language services in early intervention and educational settings" [86]. (p. 32). This resulted in the 1997 Report of the Consortium of Education Organizations on the Preparation and Use of Speech-Language Paraprofessionals in Early Intervention and Education Settings.[87]

Key features of the United States framework include:

- Three levels of paraprofessionals: aide, assistant and associate. Entry requisites, roles and responsibilities and competencies for the supervising SLP are specified for each level. Entry level requisites refer to the minimum level of education required to work at a particular level. These requirements range from a high school degree or equivalent training or education (level 1) to an associate degree in SLP or educationally related field such as early childhood (level 2) to a baccalaureate degree in SLP (level 3).

- The minimum supervision for all paraprofessionals is" the first 10 hours of direct child/family contact following training; and ten percent (10%) direct supervision of all sessions after the first 10 hours of child/family contact, to include at least one in every ten consecutive sessions" (p.35).

### Evidence

No statistically significant differences in treatment outcomes were found in a quasi-experimental comparative study involving articulation therapy provided by trained paraprofessionals versus SLPs:[88]

- In this study, 15 students with "th" for "s" substitutions were assigned to one of three groups for the S-Pack (S-Programmed Articulation Control Kit) program. In groups 1 and 2, the programs were individually administered by trained paraprofessionals; these groups were distinguished by audiotape versus videotape program presentation. In Group 3, the program was individually

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[82] Conversation with Anne Lopushinsky, Registrar, ACLSPA on 2004 October

[83] Speech, Language & Hearing Association of Alberta (SHAA). (1999) *Guidelines for the Use of Support Personnel in Speech-Language Pathology*

[84] Royal College of Speech and Language Therapists (2003 March). *Standards for Working with Speech and Language Therapy Support Practitioners*. Retrieved from College website, www.rcslt.org/pdfs.shtml on October 20, 2004.

[85] Ibid.

[86] Report of the Consortium of Education Organizations on the Preparation and Use of Speech-Language Paraprofessionals in Early Intervention and Education Settings (1997). *Journal of Children's Communication Development, 18(1)*, 31-56.

[87] Ibid.

[88] Costello, Janis and Schoen, Judith. (1978l). The Effectiveness of Paraprofessionals and a Speech Clinician as Agents of Articulation Intervention Using Programmed Instruction. *Language, Speech and Hearing Services in Schools*, 9, 118-28.

administered by a professional speech clinician. Paraprofessionals' education ranged from 2-4 years of college and an average of 6.9 hours of training on the S-Pack program. Results revealed "no significant differences in program performance among experimental groups. The children who worked with the paraprofessionals assisted by either videotape or audiotape program presentation, learned as well and as rapidly as those who worked with the professional speech clinician. All children successfully completed the program with few errors (average 90.73% correct responses), with little time expended (average 46 min), and in essentially the minimum number of responses possible (average 313)" (p. 124).

### SLP opinions

A 1995 ASHA[89] survey of school-based SLPs compared the perceptions of SLPs who did not have support staff to the SLPs who had support staff. "Although over two-thirds of all respondents did not have support staff (i.e. speech-language pathology aides or assistants), those who did were overwhelmingly positive about having this resource available to them. These respondents said that having support personnel allows them to increase the time they spend on providing direct services, such as spending more time on severe cases, doing more classroom-based work, and providing more sessions for students" (p. 186).

In Canada, a national study of rehabilitation support personnel was conducted in 1993.[90] It included four phases: census, current situation, future directions, and feasibility of future training programs. The ultimate purpose of this report was "to assist federal and provincial governments and rehabilitation professions in creating informed policies and guidelines for the education, role and supervision of future rehabilitation support personnel" (p. 1). The survey found that 77% of respondents preferred a training model that combined practical experience with academic instruction. Respondents recommended that SLPs supervise 25% of services provided by support personnel and that supervisors should have formal education in supervision.

Radaszewski-Byrne[91] describes the concerns of SLPs working in educational settings that impeded the development and implementation of United States guidelines for the use of paraprofessionals:

- Job security;
- Lack of preparation to assume legal liability and supervisory responsibilities;
- Increased work load;
- Compromised quality of services; and
- Misrepresentation of the qualifications of the service provider.

Among the concerns of administrators in the school setting regarding the implementation of the United States guidelines the authors list:

- Lack of fiscal resources;
- Lack of efficacy research;
- Lack of professional guidance; and
- Lack of inter-organizational collaboration in the development of guidelines.

In reflecting on the professional and administrators' concerns Kadaszewski-Byrne's suggest the following:

- SLPs need proper preparation to assume ethical and legal responsibilities;

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[89] Peters-Johnson, C. (1996 April). Action: school services. *Language, Speech, and Hearing Services in Schools, 27*, 185-6.

[90] Hagler, P. et al (1993). *Role and Use of Support Personnel in the Rehabilitation Disciplines*. A report to the National Health Research and Development Program. Ottawa, ON: Health and Welfare Canada. Project #6609-1730-RP.

[91] Radaszewski-Byrne, M. (1997). Issues in the development of guidelines for the preparation and use of speech-language paraprofessionals and their SL supervisors working in education settings. *Journal of Children's Communication Development, 18(1)*, 5-22.

- Pre-service preparation of paraprofessionals is necessary to relieve demands of on-the-job training;
- Guidelines for the use of paraprofessionals will assist in providing quality of care;
- Paraprofessionals are cost-effective components of education services; and
- State guidelines should be developed; and interorganizational collaboration is necessary.

# Special issues

Two special issues relevant for the delivery of SLP services in the school system were identified: services for linguistically and culturally diverse children, and transitions

## SLP for linguistically and culturally diverse children

Changing demographics and human rights legislation are driving forces for equitable service to those individuals from linguistically or culturally diverse backgrounds that have speech and language delays. In response, SLP professional organizations internationally, including Canada, have recognized and prepared position papers on the issue.

### Issue

Various authors describe changing demographics associated with immigration patterns, and the resulting challenges faced by SLPs. In some of the states in the United States, over 40% of residents are reported to come from linguistically and culturally diverse backgrounds, and it is estimated that one third of the United States population will consist of racial and ethnic minorities in the near future.[92] Based on 1999 Statistics Canada figures, the landed immigrant population comprises about 17% of the overall population, with approximately half now coming from Asia.[93]

No clear information of the prevalence of SLP problems among minority populations were found in this review, however, one group of researchers in the United Kingdom stated that "as bilingualism does not cause communication disorder, there is no reason why bilingual children should have a different rate of speech and language problems from a monolingual population"[94] (p. 353). In calculating the estimated proportion of children with speech/language disorders, the authors applied a SLP referral incidence rate of 14.6% to the 30% of ethnic minority population estimated to be under the age of 15 within their borough, resulting in an estimate of 177,600 ethnic minority children potentially requiring SLP in this one area alone.

Two national surveys (United Kingdom and United States) and one state survey regarding the provision of SLP to this special population were found in the literature review:

- In the United Kingdom, a national survey of 196 SLP managers was undertaken in 1995/96 as part of a larger initiative to investigate over- and under-representation of bilingual children in various areas of the country.[95] The authors found that 43% of the 4182 SLPs represented in the survey have bilingual children on their caseloads at any given time, and 28% have more than 5 bilingual children on their caseloads.

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[92] American Speech-Language-Hearing Association (Ad Hoc Committee). (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, III, 249-311.

[93] Reported in Roseberry-McKibbin, C. and Eicholtz, G. (1994). Serving children with limited English proficiency in the schools: a national survey. *Language, Speech and Hearing Services in Schools*, 25, 156-64.

[94] Stow, C. and Dodd, B. (2003). Providing an equitable service to bilingual children in the UK: a review. *International Journal of Language & Communication Disorders*, 38(4), 351-77.

[95] Winter, K. (1999). Speech and language therapy provision for bilingual children: aspects of the current service. *International Journal of Language and Communication Disorders*, 34 (1), 85-98.

- A national survey of school-based SLPs in the United States conducted by the American Speech-Language-Hearing Association (ASHA) in 1995 revealed that 35% of respondents had children on their caseloads who spoke a foreign language.[96] Two-thirds of the students were Caucasian, 18% were African American, 11% were Hispanic and 2% were Asian/Pacific. The proportion of students with a foreign language was contrasted with the 10% of SLPs who spoke a foreign language. Seventy five percent of SLPs stated they were assisted by an interpreter parent, bilingual SLP or other.

- A survey of 1,145 public school clinicians in California found that 94% had children with limited English proficiency on their caseload and 90% were not sufficiently proficient in a second language to provide services in it.[97] When asked what disorder types were most commonly treated among these children, 49% indicated language therapy, 31% articulation treatment, 10% stuttering therapy, 5% voice therapy and 5% indicated they served children with hearing losses. Seventy one percent stated they did not use the services of a bilingual SLP and 82% reported using an interpreter.

The Canadian Association of SLPs and Audiologists (CASLPA) describes the evolving and increasingly multicultural and multilingual Canadian context for SLPs[98]:

- "Two official languages, French and English, and their respective cultures;
- A growing number of other languages and cultures;
- Significant populations of Aboriginal people, many of whom speak native languages; and
- Members of the deaf culture who use gestural languages" (p.2).

The predominant practice issues faced by the SLP profession internationally are:[99] [100] [101] [102]

- Insufficient education of SLPs to work with bilingual and multi-cultural students. For example, Roseberry-McKibbin and Eicholtz (1994) found that only 24% of SLPs surveyed reported receiving coursework in this area.

- Insufficient numbers of multi-cultural and/or bilingual SLPs. Roseberry-McKibbin and Eicholtz note "there are very few multicultural and/or bilingual speech-language pathologists, that is, clinicians, who speak a language other than English with enough proficiency to deliver services in that language" (p. 157).

- Lack of or inappropriate use of standardized assessment instruments for languages other than English. Following a review of the literature, Young and Westernoff noted that "assessment materials in French and in Indian languages are lacking..... The reliability and validity of the use of standardized tests with minority children have been questioned, and tests have been found to be culturally and/or linguistically biased" (p. 26).

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[96] Peters-Johnson, C. (1996). Action: school services. *Language, Speech, and Hearing Services in Schools, 27(2)*, 185-86.

[97] Roseberry-McKibbin, C. and Eicholtz, G. (1994). Serving children with limited English proficiency in the schools: a national survey. *Language, Speech and Hearing Services in Schools, 25*, 156-64.

[98] Crago, M.G., and Westernoff, F. (1997). CASLPA position paper on speech-language pathology and audiology in the multicultural, multilingual context. *Journal of Speech Language Pathology and Audiology, 21*, 223-224. Taken from www.caslpa.ca/english/resources/multicult.asp.

[99] Crago, M.G., and Westernoff, F. (1997). CASLPA Position Paper on Speech-Language Pathology and Audiology in the Multicultural, Multilingual Context. *Journal of Speech Language Pathology and Audiology, 21*, 223-224. Taken from www.caslpa.ca/english/resources/multicult.asp.

[100] Stow, C. and Dodd, B. (2003). Providing an equitable service to bilingual children in the UK: a review. *International Journal of Language & Communication Disorders, 38(4)*, 351-77.

[101] Young, T. and Westernoff, F. (1999). Reflections of speech-language pathologists and audiologists on practices in a multicultural, multilingual society. *Journal of Speech Language Pathology and Audiology*, 24-30.

[102] Guillory, B.L. (2000). Project Access: a program to improve service delivery for culturally and linguistically diverse populations with speech, language and hearing disorders. *Teacher Education and Special Education, 23(4)*, 261-3.

At their 1996 professional conference, the Ontario Speech-Language Pathologists and Audiologists (OSLA) identified issues and challenges needing to be addressed by the SLP profession:[103]

- Culture – including greater cultural sensitivity on the part of SLPs, with a caution against stereotyping; awareness of cultural differences in the interpretation of language use and behaviours, including the meaning of gestures in social situations; awareness of the different beliefs across cultures about disabilities and treatment (e.g., the language of some American Indian cultures are reported to not contain a word for stuttering); and SLP expectations regarding the client, family, and professional role in therapy.

- Language – including difficulties with client awareness of and access to services; insufficient supply of bilingual/bicultural clinicians; and inappropriate use of cultural and linguistic informants/interpreters.

- Training – most SLPs "do not possess sufficient knowledge and skills necessary to work with clients from diverse cultural and linguistic backgrounds" (p. 26). A study conducted by Des Bois (1989) of Montreal SLPs "found that 40% of the respondents did not feel that they were competent to work with minority groups, 79% had not received pertinent training, and 100% felt that their knowledge of multicultural, multilingual matters was below average" (p. 26).

- Professional Matters – practice concerns include the lack of standardized assessment instruments in languages other than English, or the inappropriate use of exiting assessment tools; increased SLP time required to serve multilingual students; and lack of information and brochures that have been translated into different languages. The lack of attention to the issue by professional associations and universities was also noted. "Canadian universities that train students as SLPs have historically placed limited emphasis on meeting the needs of the multilingual, multicultural population" (p. 27).

While considerable literature was found outlining the issues associated with the provision of SLP for multi-cultural and multi-lingual individuals, this review yielded few articles describing strategies for addressing these issues, other than initiatives undertaken through SLP professional organizations (described in the following section). Guillory[104] describes a United States project to recruit, train and retain students from diverse backgrounds into the SLP profession. The initiative included strategies to raise awareness and attract students, adaptation of undergraduate and graduate SLP curricula to include consideration of appropriate assessment and intervention strategies for linguistically diverse groups, and financial and academic support of students.

### Professional guidelines

National SLP professional organizations in Canada, United Kingdom and United States have acknowledged the issue associated with SLP services to culturally and linguistically diverse groups. In each country, special committees were formed to investigate the issue and/or to develop professional guidelines.

In Canada, an ad hoc committee of CASLPA was formed in 1991, resulting in the development of the *CASLPA Position Paper on Speech-Language Pathology and Audiology in the Multicultural, Multilingual Context*.[105]

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[103] Young, T. and Westernoff, F. (1999). Reflections of speechLanguage pathologists and audiologists on practices in a multicultural, multilingual society. *Journal of Speech Language Pathology and Audiology*, 24-30.

[104] Guillory, B. (2000). Project access: a program to improve service delivery for culturally and linguistically diverse populations with speech, language and hearing disorders. *Teacher Education and Special Education*, 23(4), 271-80.

[105] Crago, M.G., and Westernoff, F. (1997). CASLPA position paper on speech-language pathology and audiology in the multicultural, multilingual context. *Journal of Speech Language Pathology and Audiology, 21*, 223-4. Taken from www.caslpa.ca/english/resources/multicult.asp

In the United States, the progress made by ASHA on the issue is tracked through the activities of various initiatives:

- In 1983, ASHA produced a Position Paper on Social Dialects and Their Implications which "emphasizes the role of the speech-language pathologist in distinguishing between dialects or differences and disorders" 106 (p. 266).

- In 1991, the ASHA Report of the Committee on Racial and Ethnic Minorities identified two issues: the shortage of SLPs to meet the needs of diverse groups; and "the need for appropriate diagnostic and therapy materials to facilitate unbiased, nondiscriminatory assessment and intervention"[107] (p. 271).

- The *ASHA Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, issued in 2000, contains a section on the issue of serving culturally and linguistically diverse children.[108]

- One of the focused initiatives in *ASHA Progress Report: Focused Initiatives 2001 – 2003*[109] was services for the culturally/linguistically diverse population. Two objectives are addressed: "increase the number of racial/ethnic minority members of ASHA" and "all ASHA members will have access to ASHA resources developed to facilitate the acquisition of cultural competency for increasing and improving service delivery to multicultural populations".

- Most recently, in 2004 ASHA's Multicultural Issues Board released the document *Knowledge and Skills Needed by Speech-Language Pathologists and Audiologists to Provide Culturally and Linguistically Appropriate Services.*[110]

In 1999, United Kingdom guidelines for SLPs were issued in the document *Good Practice for Speech Therapists Working with Linguistic Minority Communities, Guidelines of the College of Speech Therapists.*[111]

In their guidelines on the role of school-based SLPs, ASHA[112] included the following responsibilities related to the assessment of students with culturally and linguistically diverse backgrounds: a need to include cultural, linguistic and family background when taking the student's personal history, helping school staff understand the differences between communication disorders and communication differences based on culture or linguistic backgrounds, and "determining difference/disorder distinctions of a dialect-speaking student and recommending interventions only for those features or characteristics that are disordered and not attributable to the dialect" (p. 267).

In addition, the American professional organization emphasized:

- The importance of seeking SLPs with appropriate training in making distinctions between speech-language disorders and dialect. This requires that the SLP understands the first and second

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[106] American Speech-Language-Hearing Association. (1983 September). *Social Dialects and their Implications.* Position paper, ASHA, 25, 23-27. Taken from American Speech-Language-Hearing Association (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist, III*, 249-311. Rockville, MD: Author.

[107] Guillory, B. (2000). Project access: a program to improve service delivery for culturally and linguistically diverse populations with speech, language and hearing disorders. *Teacher Education and Special Education*, 23(4), 271-80.

[108] American Speech-Language-Hearing *Association (2000). Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, III, 249-311. Rockville, MD: Author.

[109] Taken from ASHA website on October 6, 2004. www.asha.org/about/leadership-projects/national-office/focused-initiatives/01-03fi-a...

[110] American Speech-Language-Hearing Association. Taken on October 6, 2004 from www.asha.org/aboaut/leadership-projects/LC/archive/LC2003/LC10-2003.htm

[111] Winter, K. (1999). Speech and language therapy provision for bilingual children: aspects of the current service. *International Journal of Language and Communication Disorders*, 34 (1), 85-98.

[112] American Speech-Language-Hearing Association (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, Rockville, MD: Author.

language, as well as "morphologic, semantic, syntactic, pragmatic, and phonological development of children from a non-English language background"[113] (p. 267).

- The need for caution during testing whereby "if a test was not normed on bilingual or limited English-proficient students, then the test norms may not be used" (p. 267).
- That only those SLPs knowledgeable of the dialect can provide recommendations within the classroom.

The Canadian professional organization, in its guidelines[114], specifies that:

- Professional competency for serving this population "may be achieved through (a) bilingual-bicultural clinicians or (b) a group of collaborators who combine their complementary interactive competencies" (p. 2). Such collaboration must include an SLP and others with the same language/dialect as the client and who speak it with "native or near native proficiency" (p. 2).
- Regarding assessment:
  - Identification of disorders through assessment is optimally made in the client's first language;
  - Assessment should include the use of nonstandardised approaches; The assessment should include consideration of societal factors that impede language proficiency such as first language loss and biased educational practices; and
  - The assessment reports should be descriptive.
- There is need of a distinction between clients who are appropriately proficient in the second language although they have full language potential, and those clients who are not fully proficient in both languages because of a communication disorder.
- Intervention by the SLP (using collaborators) should be in the client's first language "when appropriate" and bilingual clients should preferably receive "bilingual/bicultural intervention" (p. 3).
- "Intervention materials, strategies, procedures and interpersonal contexts" should be culturally adapted" (p. 3).
- Accents and English/French dialectual variations should not be considered or treated as pathological.

## Transitions

The literature review yielded a limited number of articles on the topic of transitions for children with speech and language delays/disorders. A few descriptive surveys were noted, but most articles represented informed opinion.

Three transition themes were identified in this literature review:

- Transitions in the early years – from home to preschool/kindergarten to elementary school;
- Transitions from self-contained language units/classrooms to mainstream schools; and
- Transitions from secondary school to post-secondary settings.

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[113] American Speech-Language-Hearing Association (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, III, 249-311. Rockville, MD: Author.

[114] Crago, M.G., and Westernoff, F. (1997). CASLPA position paper on speech-language pathology and audiology in the multicultural, multilingual context. *Journal of Speech Language Pathology and Audiology*, *21*, 223-224. Taken from www.caslpa.ca/english/resources/multicult.asp

## Early years

Toohey and Day[115] outline literature on the topic of transitions in the early years, in particular, entry to kindergarten. They cite the work of LeCompte (1981) who described a benign and required transition of "civilizing" children as they learn "how to manage and be managed by teachers and others" who will treat them more uniformly and objectively than in their pre-school experience (p. 3). Later authors are reported to contradict this "benign uniform and objective standards of behavior" theory, finding that "school practices create particular identities or ranks for children" and there is considerable attempt to normalize them (p. 3). "Kindergarten attendance marks a substantial shift in how children's behaviour, growth and development are assessed and compared with others" (p. 21) The authors further argue that "parents are encouraged to accept school-created identities for their children, and that as well as civilizing children, school entry imposes certain practices and knowledge on the parents and families of such children (p. 3).

Donlan,[116] in reviewing the research findings of various authors concludes that the problems experienced by children as they move to different educational placements may be exacerbated for children with communication problems, and recommends that any serious look at the effects of school practices on the child with speech and language impairment must "address the complex interaction of at least three factors:

- Potential of the child given biological and genetic predispositions to a particular pattern of development with which speech and language skills are subject to a varying range of possible impairments;
- The sensitivity of professionals concerned with the child's education to individual patterns of learning and social development; and
- The extent to which the managed environment which the school placement provides can satisfy individual needs" (p. 213).

Based on a longitudinal case study of two language minority children as they moved from home to kindergarten through their first two school years, Toohey and Day[117] found that these early transitions were particularly difficult for language minority children, with "teachers believing that they had fewer cognitive, social and linguistic resources than their parents perceived. In both cases, the school's sorting practices negatively impacted [the children's] educational experiences" (p. 1).

Prendeville and Ross-Allen[118] listed the number of changes that present challenges for children with disabilities as they transition through their early preschool and school years:

- "Reduction in the adult/child ratio;
- Increase in the number of children in school and educational groups;
- Greater length of class periods;
- New transportation arrangements;
- Changes in the type and amount of family involvement;
- Increased expectations for independent work;
- Decreased individual support;
- Different curricular content;
- Variation in the manner of teacher instruction or directions; and
- Increased expectations for knowledge of classroom rules and routines" (p. 130).

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[115] Toohey, K. and Day, E. (February 2001). *Home to School/Kindergarten to Grade 1: Incommensurable Practises?* Paper presented at the Annual Meeting of the American Association for Applied Linguistics. Ottawa, ON: Canadian Social Science and Humanities Research Council.

[116] Donlan, C. (1998). The importance of educational transitions. *International Journal of Language and communication Disorders, 33(2),* 212-9.

[117] Toohey, K. and Day, E. (February 2001). *Home to School/Kindergarten to Grade 1: Incommensurable Practises?* Paper presented at the Annual Meeting of the American Association for Applied Linguistics. Ottawa, ON: Canadian Social Science and Humanities Research Council.

[118] Prendeville, J. and Ross-Allen, J. (2002). The transition process in the early years: enhancing speech-language pathologists' perspectives. *Language, Speech and Hearing Services in Schools, 33,* 130-6.

To address these challenges and ensure that transitions are as smooth as possible for children with disabilities, Prendville and Ross-Allen advocate for "formal, individualized, collaborative transition planning" (p. 130). Specifically, they identified the following components necessary for successful transitions between preschool and kindergarten settings:

- "Family-school partnerships that promote family participation,
- Collaboration and communication that facilitates successful team processes, and
- Formal policies and procedures to ensure consistency and common expectations for transition planning" (p. 132).

### Self-contained language units to mainstream education

Botting, Crutchley and Conti-Ramsden[119] conducted a study in England of 242 children who spent at least half of their time in one of 118 language units (i.e., language-based classrooms for children with specific language impairment). Details of the study are as follows:

- The language units, while attached to mainstream schools, were often not the home mainstream school, thus travel was necessary for most children. The units were either self-contained classrooms on the school grounds or part of an open plan school structure. The authors followed the students from the first study year in which all children attended language units, to their subsequent placements in the following school year. The students were seven years of age at the start of the study. The researchers compared the ideal year two placement (as recommended by the year 1 teacher) with the actual subsequent placement, and asked year 2 teachers and parents to rate their happiness with the second study year placement.

  Of the 222 students at the end of the study, 65% were found to have stayed in a language unit; 28% were integrated fully into the mainstream program and special provisions were made for the remaining 7% of the students. The results also identified a discrepancy between the recommended ideal and actual placements, with 44% not attending the recommended type of placement. The findings led the authors to suggest it is erroneous to assume that children will have outgrown or overcome their language difficulties by the end of the third year of primary school.

  Teachers of children who were placed in the non-ideal setting were more often less happy with the child's placement in their class (than if the first teacher had recommended the placement) and were likely to label the children as having learning difficulties. Parents were found to be happiest if their children stayed in the unit, leaving the author to speculate that either the subsequent placement elsewhere did not meet the parents' expectations or that the upheaval involved was perceived by parents to outweigh the possible benefits of the placement.

The Botting Crutchley and Conti-Ramsden study prompted several commentaries by other authors:

- Donlan[120] emphasized the importance of placement decisions and transitions at this stage in the school careers of children with speech and language disorders. The authors cites the finding of an earlier study by Griffiths (1969) who suggested that "children whose rapid improvement in language skills in early childhood merited an early return to mainstream education (without special support) may have been exposed to additional stress" (p. 212).

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[119] Botting, N., Crutchley, A., and Conti-Ramsden, G. (1998). Educational transitions of 7-year-old children with SLI in language units: a longitudinal study. *International Journal of Communication Disorders, 33(2)*, 177-219.

[120] Donlan, C. (1998). The importance of educational transitions. *International Journal of Language & communication Disorders, 33(2)*, 212-5; *discussion* 215-19.

- Greenhalgh and Mason[121] indicated that the Botting et al findings prompted several changes to their school practices:

> "The finding that children who moved out of their language units were likely to be viewed by their new teachers as having learning difficulties .... led us to review the transition support offered to the teaching staff and schools receiving our children. Although our personal experience has identified that the abilities of our children are often under-estimated we had not realized the true extent or consequence of this. We have now identified a training need and the requirement for increased non-contact time for the unit teacher and new teacher in order that knowledge can be shared and the child's future educational development match is or her learning skills" (p. 211).

> "We were very interested in the identified difficulties that parents experience when their child moves from the Language Unit. This supports our personal experience that even when a child is moving to an 'ideal' placement, the parents are extremely unsettled. This has led us to review our current situation and our need to develop our role with parents at this difficult time in order that the process is a positive one" (p. 211).

### Secondary to post secondary

Aune and Friehe[122] address transition to postsecondary education with special emphasis on those with language and learning disabilities:

- Referring to the findings of the 1992 National Longitudinal Transition Study (NLTS) in the United States, they conclude that "individuals with speech impairment and learning disabilities pursue college at lower rates than do individuals with other disabilities" (p. 4). The NLTS study found that while 68.3% of the general population enrolls in postsecondary education, only 14% of those with disabilities do so. Although the NLTS results focus on students with learning disabilities, Aune and Friehe note "what is known about transition for students with learning disabilities is likely relevant for a significant proportion of those identified with language disorders" (p.4).

Aune and Friehe argue that this transition issue should be seen as a school-wide issue rather than a special issue, and identified a number of institutional and systemic problems that could account for the noted discrepancy:

- Attitudes of educational personnel towards students with learning disabilities;
- Need for collaboration between secondary and postsecondary schools;
- Understanding of different legal guidelines governing secondary and postsecondary schools governing these students;
- Lack of sufficient accommodation for the students such as lack of support services (e.g., tutoring);
- Use of postsecondary special services (i.e. some institutions have disability services offices but students may be reluctant to access them);
- Flexibility in policies and procedures at the postsecondary level for students with disabilities; and
- The need to think beyond high school graduation by focusing on program outcomes for students with disabilities.

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[121] Greenhalgh, D. and Mason, A. (1998). Educational transitions: what do they mean to our language unit? *International Journal of Language and Communication Disorders, 33(2),* 210-1; *discussion* 215-9.

[122] Aune, B. and Friehe, M. (1996). Transition to postsecondary education: institutional and individual issues. *Topics in Language Disorders, 16(3),* 1-22.

One clear directive and several suggestions for addressing this issue in the United States literature were found:

- One of the requirements of Individuals with Disabilities Education Act 1977 (IDEA) is that "by age 16 every student have explicitly written in the IEP a plan for transition to employment or post secondary education".[123]

- The United States National Joint Committee on Learning Disabilities (NJCLD) has issued a position paper on Secondary to Postsecondary Education Transition Planning for Students with Learning Disabilities.[124] The Committee proposes that transition planning needs to be a collaborative effort involving the student, parents, secondary school and postsecondary school, "to help the student select, access, and succeed in a postsecondary education program" (p.4). The position paper identified roles and responsibilities for each key player. The student's participation is viewed as central to the decision-making process and must be initiated "as early as possible and no later than age 16" (p. 1). The parent's role is to provide support and encourage the student's self-advocacy skills. Secondary school personnel should assist with planning services that are consistent with rules and regulations, and monitor the transition. Postsecondary personnel are responsible for networking with other team members and assisting to meet the needs of the students.

# Caseload Management

In previous chapters, service delivery options and issues for SLPs in the school setting were presented. In this section, the focus shifts to the overall organization of services. The key questions SLPs face in managing their caseloads are how to allocate their services and time most effectively, efficiently and fairly; and what alternative means of service delivery are viable, especially for those in remote geographical areas. The literature review findings are presented under the following topics:

- Access considerations;
- Caseload size;
- Admission, prioritization and exit/dismissal;
- Scheduling; and
- Use of technology.

## Access considerations

Two articles describing access and equity issues associated with services in remote areas were found.

- Grela and Illerbrun[125] conducted a parent satisfaction survey of speech and language services for preschoolers in rural Saskatchewan. The organization of service delivery is similar to that used for many Alberta preschoolers, involving parent/guardian and child travel to a community clinic. The Saskatchewan services reported in this study are organized so that the maximum travel distance for parents is 100 km and the travel distance for more than two thirds of parents is 50 km or less, or 30 minutes. The study authors found that 72% of the parents were satisfied and 10% were dissatisfied with service convenience as measured by travel time. Several parents commented that they would prefer to have the service available in their own home communities.

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[123] Retrieved from on October 27, 2004 from Law and exception students website: www.unc.edu/~ahowell/exceplaw.html

[124] American Speech-Language-Hearing Association (ASHA). (1994 January) *Secondary to Post secondary Education Transition Planning for Students with Disabilities.* A Position paper of the National Joint Committee on Learning Disabilities. Retrieved from the ASHA website http://www.asha.org/default.htm.

[125] Grela, B. G. and Illerbrun, D. (1998). Evaluating rural preschool speech-language services: consumer satisfaction. *International Journal of Disability, Development and Education, 45(2),* 203-16.

- Wilson, Lincoln and Onslow[126] conducted a study to provide information on inequities in access to speech-language services between rural and urban areas in Australia, using a semi-structured interview with 12 SLPs. They determined there were differences in access across regions, and "local, frequent speech pathology services were not universally available" (p.9). More barriers to access were found in rural areas which SLPs felt compromised service quality. The barriers noted included "distance and travel, transport disadvantage [i.e. limited access to public transport], socioeconomic status [i.e. cost of gas may be deterrent to travel], and costs of access [i.e. loss of income to travel long distances]" (p.14). Differences in SLP service delivery between metropolitan and rural areas were evident, including greater use of home and school [consultative] services and more use of the telephone, either routinely or infrequently, in the rural and remote areas.

  These Australian authors[127] differentiated three levels of SLP service availability to towns: *frequent* (at least one day every two weeks), *limited* (at least once per month but less than bi-weekly); and *outreach* (less than monthly). Clients who lived in towns with limited, outreach or no SLP needed to travel to access services more frequently. According to the authors, a "critical maximum distance analysis suggested that speech pathology services should be located so that no client need travel further than 65 kilometers to access a frequent service" (p.17).

## Caseload size

### Evidence

The National Outcomes Measurement System (NOMS) was developed by ASHA as a method of determining effectiveness of school-based speech and language services.[128] The NOMS database includes 18,000 students from grades K to 12, whose primary eligibility is either speech and language impairment or a specific learning disability.

Several authors report on analyses of the NOMS database that suggest the effectiveness of SLP is influenced by caseload size.

- Cirrin et al[129] report that when caseload size is less than 40 for SLPs serving K-12, 87% of students make measurable progress on speech sound production. In contrast, when caseload size is greater than 60, only 64% of children make gains on this measure.

- Schooling[130] reports on the results of teacher surveys which asked their judgment of the progress made by children in reading skills, written language skills and following classroom routines that could be attributed to SLP services. When SLP caseload size was less than 40, 90% of teachers indicated that the student demonstrated improved pre-reading, reading or reading comprehension skills. When caseload size was between 50-59, the percent of teachers indicating such improvement fell to 73%, and when caseload size was 70 or greater, only 60% of teachers reported improved reading skills.

  Similar patterns were observed for the other two areas of inquiry. Approximately 90% of teachers reported improvement in following classroom routines when SLP caseloads were less than 40,

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[126] Wilson, L., Lincoln, M. & Onslow, M. (2002). Availability, access, and quality of care: inequities in rural speech pathology services for children and a model for redress. *Advances in Speech-Language Pathology, 4(1),* 9-22.

[127] Ibid.

[128] Schooling, T.C. (2003). Lessons from the National Outcomes Measurement System (NOMS). *Seminars in Speech and Language, 24(3),* 245-56.

[129] Cirrin, F., Bird, A., Biehl, L., Disney, S., Estomin, E., Rudebusch, J., Schraeder, T. and Whitmire, K. (2003). Speech-language caseloads in the schools: a workload analysis approach to setting caseload standards. *Seminars in Speech and Language, 24(3),* 155-80.

[130] Schooling, T. C. (2003). Lessons from the National Outcomes Measurement System (NOMS). *Seminars in Speech and Language, 24(3),* 245-56.

and this fell to 67% when SLP caseloads were 70 or greater. The authors also noted that "as caseload size increases, fewer teachers note improvement in students' writing abilities" (p. 253).

In their review of various NOMS database findings, Cirrin et al[131] draw the following tentative conclusions:

- "Large caselads affect available service options. Large caseloads related to less individual treatment, more group treatment and an increase in the size of treatment groups.
- Large caseloads appear to minimize opportunities for individualization of interventions.
- Students on large caseloads appear to take longer to make progress on communication skills" (p. 164).

Cirrin et al also note that most research on caseload, including the NOMS results, have been based on the traditional pull-out model. "There is a lack of research on the effects of caseload size on services delivered through classroom-based, collaborative, or indirect-consultative options" (p. 161).

### Practice

Two surveys investigating SLP practice in regard to caseload size were identified.

- In 2003, Vision Research[132] conducted a survey of full-time CASLPA members to determine existing caseload size and obtain recommendations on caseload size for preschool and school-age children. The 167 SLPs working with children under six years of age reported caseloads ranging from less than 10 to 75, with a median caseload of 41. Forty six percent reported caseloads exceeding 75.

  The median caseload size for the 132 SLPs serving predominantly school-aged children over six years of age was found to be 60 clients.[133] Approximately 39% had a monthly caseload of more than 75 clients.

  SLPs whose clients consisted of only school-age children had larger caseloads averaging 78 students than those SLPs whose caseload was mixed, including either younger children or adults in addition to the school-aged population. The average caseload size for the latter group of SLPs was 63.

  When asked what caseload size they recommended, SLPs who worked predominantly with children under the age of six indicated 31 clients; those predominantly serving school-aged children recommended a caseload size of 36.[134]

- Cirrin et al[135] report a survey of caseload size in the United States that was completed by ASHA in 2000 is consistent with findings in NOMS. According to these authors "the average (median) monthly caseload of school-based ASHA-certified SLPs is 53 with a range from 15 to 110. These data are consistent with the findings of the ASHA 1999-2000 National Outcomes Measurement System (NOMS) report, which found caseload sizes ranging from 25 to 104 with an average caseload of 52.4 students" (p. 156).

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[131] Cirrin, F., Bird, A., Biehl, L., Disney, S., Estomin, E., Rudebusch, J., Schraeder, T. and Whitmire, K. (2003). Speech-language caseloads in the schools: a workload analysis approach to setting caseload standards. *Seminars in Speech and Language, 24(3)*, 155-80.

[132] Vision Research. (2003 December). *2003 Caseload Guidelines Survey Final Report for Speech-Language Pathology*. Prepared for Canadian Association of Speech-Language Pathologists and Audiologists.

[133] Ibid.

[134] Ibid.

[135] Cirrin, Frank et al (2003). *Speech-Language Caseloads in the Schools: A Workload Analysis Approach to Setting Caseload Standards, Seminars in Speech and Language, 24(3)*, 155-180.

The SLPs surveyed by Vision Research and Cirrin et al[136] note that the full scope of an SLPs workload includes more than direct service delivery and caseload work. "In addition to conducting speech-hearing-language screenings and comprehensive diagnostic evaluations, SLPs write reports/chart results, train and supervise assistants or volunteers, participate in multi-disciplinary teams and conferences, confer with clients' families, complete documentation, as well as participating in continuing professional development, and other activities as employees or consultants... Working with classroom teachers and parents is an important part of the work for SLPs treating school-age children" (p. 22).

### Professional guidelines

The American Speech-Language and Hearing Association (ASHA) issued guidelines for caseload size in 1993.[137] These are reported in the Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist.[138] The recommended caseload for school-based SLPs is 40 students, irrespective of the type or number of service delivery models used, although caseloads comprised of special populations may necessitate fewer students. These special populations may include children who are "technologically dependent, medically fragile, multilingual or limited-English proficient" (p. 274). If the caseload is comprised of pre-schoolers only, the recommended guideline is 25 children. The authors note that these guidelines were established prior to the implementation of United States legislation on inclusion (IDEA). They also note that some states limit the size of self-contained classrooms, and ASHA recommends a caseload of eight for this setting if no support personnel are available or 12 students with support personnel.

ASHA has identified a need to address the issue of caseload size in schools. In their 2001-2003 Focused Initiatives document[139] they state "a full scale, multi-faceted approach at the federal, state and local levels is needed to address ASHA member concerns indicating that many service programs in the schools require caseloads for speech-language pathologists and audiologists that are too high in number to provide quality services..." (p. 3). In response to this issue they have worked toward a workload analysis approach which considers the full scope of an SLP's responsibility rather than solely a caseload measure relating to direct service delivery only.

No formal caseload guidelines by the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA) were found.

## Admission, prioritization and exit/dismissal

### Admission

Caseload management requires SLPs to make decisions regarding when students should be admitted to, and later discharged or dismissed from SLP. When available resources exceed the demand for services, the process of entry/exit criteria is compounded by the task of clear prioritization as a means of rationing services.

No evaluative studies were identified in the areas of entrance/exit criteria and prioritization. Professional guidelines, perceptions and informed opinions are presented.

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[136] Cirrin, F., Bird, A., Biehl, L., Disney, S., Estomin, E., Rudebusch, J., Schraeder, T. and Whitmire, K. (2003). Speech-language caseloads in the schools: a workload analysis approach to setting caseload standards. *Seminars in Speech and Language, 24(3)*, 155-80.

[137] American Speech-Language and Hearing Association. (1993, March). *Guidelines for Caseload Size and Speech-Language Pathology Delivery in the Schools*. ASHA, 35(suppl.10), 33-39. Rockville MD: Author.

[138] American Speech-Language-Hearing Association (2000). *Guidelines for the Roles and Responsibilities of the School-Based Speech-Language Pathologist*, III, 249-311. Rockville MD: Author.

[139] American Speech-Language and Hearing Association. Final Progress Report: Focused Initiatives 2001-2003. Retrieved on 2004 October 04 from ASHA website: http://www.asha.org/about/leadership-projects/national-office/focused-initiatives/01-03fi-a.

O'Brien and Huffman[140] note that, in the United States at least, eligibility for special education and related services are more clearly defined through legislation than are exit criteria. SLP is one of seven disability categories that has as one of its eligibility criteria, the requirement that the disability affects educational performance. The law also requires that SLP be delivered by a qualified provider and, in some states, the frequency and duration of SLP services are prescribed. Lack of funding is not acceptable as a reason for denying service if the Individualized Education Plan (IEP) team determines that a child needs service.

The American Speech-Language-Hearing Association (ASHA) guidelines on admission/discharge criteria[141] specify that:

> "In general, individuals of all ages are eligible for speech-language pathology services when their ability to communicate and/or swallow effectively is reduced or impaired or when there is reason to believe that treatment will prevent the development of a speech, language, communication, or feeding and swallowing disorder; reduce the degree of impairment; lead to improved functional communication skills; ... or prevent the decline of communication ... abilities. The decision to admit an individual to speech-language pathology services in a school, health care, or other setting must be made in conjunction with the individual and family or designated guardian, as appropriate" (p. 67).

## Prioritization

While a number of articles identify prioritization schemes/factors, no evaluative studies were found. Four viewpoints on prioritization elements are summarized in this section:

- McCartney[142] notes the following prioritization parameters in the literature: *severity* of the problem; predicted *permanency* or *chronicity* of the problem; *age* with a preference for early intervention; *need for techniques specific to SLP*; *communication environment*, including how well the environment is meeting needs; *anxiety* and *willingness to cooperate on the part of carers* (including teachers); and *readiness for therapy*, including the child's motivation. Parameters are typically weighted and result in an indication of higher or lower priority levels when selecting children for service.

- Law et al[143] conducted a systematic review of speech and language screening and, based on research findings, suggested that children with language delays have more persistent and more serious problems than do children with articulation/phonology disorders, and "it is possible to use the literature to pick out a number of factors that increase the risk of persistent delay" (p. 21). The factors included: *age (*noting that children over 26 months have poorer outcomes for expressive syntax); *severity* of delay; *range of speech and language areas affected* – that is, poorer outcomes if both expressive and receptive language delays are present; general ability of child; and *associated factors* such as neurodevelopmental factors and hearing loss.

- In Alberta, a priority setting framework was developed in 1995 for use by the rehabilitation disciplines included in the Community Rehabilitation Program.[144] Determination of an individual's need for therapy was based on: *impact of the problem* (i.e., severity, level of functional impairment, individual's perception of impact on their quality of life), *predicted outcome* (probability that the service can make a difference and extent of research evidence to support

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[140] O'Brien, M. A. and Huffman, N. P. (1998). Impact of managed care in the schools. *Language, Speech and Hearing Services in Schools*, 29, 263-9.

[141] American Speech-Language-Hearing Association (Ad Hoc Committee). (2004). Admission/Discharge Criteria in Speech-Language Pathology. *Author*, 24, 65-70.

[142] McCartney, E. (2000). Include us out? Speech and language therapists' prioritization in mainstream schools. *Child Language Teaching and Therapy*, 165-80.

[143] Law, J., Boyle, J., Harris, F., Harkness, A. and Nye, C. (1998). Screening for speech and language delay: a systematic review of the literature. *Health Technology Assessment*, 2(9).

[144] Wanke, M.I. (February 1995). *A Priority Setting Framework for Community Rehabilitation Programs in Alberta Regional Health Authorities*. Prepared for External Stakeholder Community Rehabilitation Working Group. Edmonton AB: Alberta Health and Wellness.

intervention), and *risk of delay* (risk to safety, maximizing functional ability and possibility of deterioration).

- Wren, Roulstone, Parkhouse & Hall[145] provide an example of how priorities for service are based on the broader context of educational environment. The WiSalt project looked at four bases of need: child-based needs, class-based needs, teacher/therapist-based needs and school-based needs. Within the project, equal amounts of time were to be dedicated to each of the four bases of need varying from one day per week (most) to half day every two weeks (least) throughout the school year.

In her article *Include us out?* McCartney[146] eloquently describes the problems SLPs face as they make decisions regarding which children should be considered for service in mainstream schools, noting that prioritizing children in an "increasingly inclusive education context" (p. 165) is problematic, especially in the absence of effectiveness studies. She eloquently describes the tension between "health as a prioritizing service and education as an allocating service, which all children receive as a right" (p. 167). In the education sector, "prioritizing due to resource constraints is not acceptable" (p. 168). "Children have a right to excellent and appropriate education; a right to access their national curriculum, right to have their special educational needs met, right to such support as is needed to help them progress" (p.167).

On the other hand, in health care, caseload is actively managed "to ensure fair and equitable service based on need" (p. 166). "Prioritization decisions are set in the NHS [National Health Services] context of clinical governance, a quality management system where treatment is to be offered based on evidence of effectiveness, and where audits of outcomes are undertaken to ensure children are not subjected to inappropriate therapy practices and that public money is not wasted... Priority for service has to be balanced against the amount of service available." (p. 160).

McCartney proposes no ready answer for the dilemma but advocates that as SLPs and educators "seek to develop joint approaches to service delivery there will have to be systematic exploration of ways in which to 'include us in'" (p. 176).

### Exit/dismissal

ASHA's guidelines on admission/discharge criteria[147] specify that "discharge from treatment ideally occurs when the individual, family, or designated guardian, and speech-language pathologist as a team conclude that the communication ... disorder is remediated or when compensatory strategies are successfully established" (p.76). According to these guidelines the following circumstances warrant discharge:

- The speech, language or communication disorder reaches normal limits or is consistent with their pre-morbid status.
- The treatment goals and objectives are met.
- Communication abilities have become comparable to others of the same chronological age, gender, ethnicity, or cultural and linguistic background.
- The individual's educational, social, emotional, vocational performance or health status is no longer adversely affected by the speech, language or communication level.

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[145] Wren, Y., Roulstone, S., Parkhouse, J., and Hall, B. (2001). A model for a mainstream school-based speech and language therapy service. *Child Language Teaching and Therapy, 17(2)*, 107-26.

[146] McCartney, E. (2000). Include us out? Speech and language therapists' prioritization in mainstream schools. *Child Language Teaching and Therapy*, 165-80.

[147] American Speech-Language-Hearing Association (2004). *Admission/Discharge Criteria in Speech-Language Pathology*. Rockville MD: Author. 24, 65-70.

- Optimal communication across environments and communication partners is achieved.
- The individual's desired level of communication skills has been attained. (p. 68)

Additional factors involve the individual, family or designated guardian's decision to discontinue treatment or request another SLP, family relocation or where attendance has been inconsistent or poor despite efforts to address the issue.

O'Brien and Huffman[148] note that the shift towards outcome-based practice has resulted in SLPs examining exit criteria and the appropriate length of treatment for specific disorders. "It is no longer sufficient for speech-language pathologists in school practice to just show that what they do is effective.... [They] must participate in the process of measuring how long therapy for a particular disorder should take..." (p.267).

O'Brien and Huffman report the work of Huffman[149] (1996), who found discrepancies in dismissal rates across elementary schools. The most critical barriers to dismissal, as reported in staff interviews, included:

- Continuation of a student whose progress is limited and whose test scores are low, yet commensurate with IQ level;
- low standardized scores on speech-language testing;
- 80% mastery level unacceptable to many parents;
- Students not maintaining skills after dismissal; and
- Professional mind-set of a 10 month school year as a parameter of service.[150] (p. 264)

## Scheduling

Caseload management requires SLPs to perform the ongoing task of determining the most effective manner to schedule speech and language intervention. Although one description of a rotational scheduling system was identified, the reviewers found no evidence articles on this topic. A limited number of articles on the topic of frequency, intensity and optimal length of treatment present some information potentially useful for those considering a block scheduling model.

### Evidence

- Fey, Cleave and Long[151] found that children receiving grammar treatment demonstrated significantly smaller gains in a second five month phase of therapy compared with the initial five months of therapy.
- A meta-analysis conducted by Nye, Foster and Seaman[152] found the smallest effect size for programs lasting more than 13 weeks, suggesting there may be an optimal length of treatment past which gains are significantly less apparent. The authors also found that treatments programs lasting more than 90 minutes yielded smaller effect sizes than those lasting less than

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[148] O'Brien, M. A. & Huffman, N. P. (1998). Impact of managed care in the schools. *Language, Speech and Hearing Services in Schools, 29*, 263-9.

[149] Huffman, N.P. (1996). *Report to the BOCES #1 Board of Education: Speech-language pathology program practices in dismissal or exit from services.* Unpublished paper.

[150] O'Brien, M. A. & Huffman, N. P. (1998). Impact of managed care in the schools. *Language, Speech and Hearing Services in Schools, 29*, 263-9.

[151] Fey, M.E., Cleave, P.L. and Long, S.H. (1997). Two models of grammar facilitation in children with language impairments: Phase 2. *Journal of Speech and Hearing Research, 40*, 5-19.

[152] Nye, C., Foster, S. H., Seaman, D. (1987). Effectiveness of Language Intervention with the Language/learning Disabled. *Journal of Speech and Hearing Disorders, 52*, 348-57.

90 minutes. The authors suggest a need for further research on the "interactive effects of various lengths of treatment, types of treatment, and subject characteristics" (p. 353).

- Law, Garrett and Nye,[153] reporting on the Nye et al meta-analysis, indicate that the greatest effect size was observed for treatments between four and twelve weeks in length.

- In a RCT, Barratt, Littlejohns and Thompson[154] compared two patterns of treatment frequency with 42 preschool children: one 40-minute session a week versus intensive 40-minutes sessions four times per week, both over a six month period. As measured on Reynell scales, results indicated that both groups showed an improvement in comprehension with no significant differences between the groups. In the area of expressive language, both groups showed an improvement; however the intensive therapy group demonstrated significantly greater improvement.

  Barratt et al also found that, of the six programs that had received intensive therapy, three considered the model to be an improvement over weekly sessions. The main perceived advantage was that a relationship was more readily established between the therapist and child.

### Practice

Only one article was found that described the scheduling pattern used by SLPs when serving schools.

- Wren, Roulstone, Parkhouse and Hall[155] describe a rotational model in which the first term is devoted to child assessment and teacher training. "During the second term, children are seen for therapy, often in groups, with teachers or assistants from the schools working alongside the therapists. In the third term, most therapy activities are carried out by school staff, with SLTs visiting occasionally to monitor progress." (p. 108).

## Use of technology

The use of technology to facilitate the provision of speech and language services has received increasing attention in recent years. In this section, three studies involving telehealth technology and one on the use of computers are presented.

### Telehealth

- Sicotte et al[156] studied the treatment outcomes for four children and two adolescents who received stuttering treatment via videoconference. Qualitative and quantitative measurements included patient attendance, a questionnaire to identify potential barriers, and client/parent and SLP ratings of technical and clinical quality of sessions. Results revealed excellent attendance, a high rate of client and SLP satisfaction, and no concerns about treatment from a distance (five of six clients traveled less than 30km return trip). All clients showed an improvement in fluency, ranging from 13% to 36% stuttering before treatment to 2% to 26% after treatment. It was noted that telehealth intervention with young children can impose an additional burden for SLPs and parents who must manage young children during sessions.

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[153] Law, J., Garrett, Z. and Nye, C. (2004). *Speech and Language Therapy Interventions for Children with Primary Speech and Language Delay or Disorder.* Cochrane Database of Systematic Reviews, 2. Updated 29-May-2003. Retrieved from http://gateway.ut.ovid.com/gw1/ovidweb.cgi on September 16, 2004.

[154] Barrat, J., Littlejohns, P., and Thompson, J. (1992). Trial of intensive compared with weekly speech therapy in preschool children. *Archives of Disease in Childhood, 67*, 106-8.

[155] Wren, Y., Roulstone, S., Parkhouse, J., & Hall, B. (2001). A model for a mainstream school-based speech and language therapy service. *Child Language Teaching and Therapy, 17(2)*, 107-26.

[156] Sicotte, C., Lehoux, P., Fortier-Blanc, J. and Leblanc, Y. (2003). Feasibility and outcome evaluation of a telemedicine application in speech-language pathology. *Journal of Telemedicine and Telecare, 9*, 253-8.

- Jessiman[157] evaluated two areas for two school-aged children, including: a comparison of speech and language assessments via telehealth system compared to in-person; and progress in articulation and language treatment via telehealth (note: not contrasted with in-person treatment). Results of in-person and telehealth articulation assessments were identical when using lapel microphones. Children "progressed in their speech and language goals quickly over the 12 sessions" (p.48) using telehealth technology. The author describes technological and logistical problems which included sound quality variations depending on type of microphone and audio time delay.

- In Cold Lake, Alberta, a trial project using telehealth technology to provide services to five to nine year old children in schools was evaluated.[158] In this pilot, telehealth was used as a "tool to fill in service gaps in chronically deprived service areas, by linking speech-language services from an urban center to a northern community. The intent was to apply telehealth in a manner that would support an augmented service delivery model that integrates the speech program with classroom learning and home support" (p.1).

  The author notes a number of issues in the use of this technology, including concerns with suitability for children with severe needs or when close observation is required – for example, resonance difficulties. Some children may require time to adjust to the technology. Consideration must be given to the school's amenability (i.e., teacher skills), and there was a need for key contacts within the school for communication purposes. Effective communication between SLP and on-site assistants was noted as was the SLPs' ability to observe the sessions and transfer responsibilities. While parent involvement was desirable, variability in skill level and training requirements was noted. Cost benefit is implied from this project; however this aspect was not fully evaluated.

The above studies offer cautious support that the use of telehealth may be a viable treatment option, with due consideration to the issues involved.

### Computers

- Cochrane and Masterson[159] summarize research related to the efficacy of clinician-facilitated computer activities and conclude "studies have shown clinician-mediated computer-based activities to be comparable in efficacy to traditional activities of a similar nature. It is important to note that the computer-based activities in each case were deliberately matched to (and therefore limited by) familiar off-computer activities" (p. 216). Issues related to use of computers include:

  - Limited or no access to computers;
  - Lack of training regarding using computers;
  - Concern that students will be intimidated by the computer;
  - Decreased time spent teaching computer skills rather than other goals;
  - Doubts regarding efficacy of computer use.

  Cochrane and Masterson suggest the following roles for computers: "as a context for conversation, a tool for learning, a tool for linguistic or phonological analysis, a tool for data collection, a treatment materials generator, and a biofeedback device" (p.213).

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[157] Jessiman, S. M. (2003). Speech and language services using telehealth technology in remote and underserviced areas. *Journal of Speech-Language Pathology and Audiology, 27(1)*, 45-51.

[158] Kawun, L. (September 2004). *Evaluation Results Tele-Health Pilot Project: Lakeland Speech Language Committee Creative Delivery of Speech and Language Services in Districts with Chronic Shortages*. Unpublished paper.

[159] Cochrane, Paula S. and Masterson, Julie J. (1995). NOT using a computer in language assessment/intervention: In defense of the reluctant clinician. *Language, Speech and Hearing Services in Schools*, 26, 213- 22.

# Appendix A:

# Methodology

# Methodology

The objective of the literature review was to undertake a systematic review on the topic of service delivery models for speech-language pathology services to Early Childhood Services (ECS) and school-aged children. The approach was to identify and limit the search to the best articles offering the most relevant information and using the strongest methodological designs, rather than a large quantity of articles representing weak study designs. This involved a 3-step process.

## Step 1: Review questions

1. What service delivery models for SLP services (K through G12) delivered in schools or kindergarten settings are considered to be effective?
2. What aspects of service delivery models for SLP services (K through G12) are considered to be effective? Specifically, the search focused on the following aspects:
   - Direct SLP versus consultative approaches to service delivery
   - Multi-disciplinary versus single disciplinary service delivery
   - Group versus individual therapy
   - Use of paraprofessionals (i.e., SLP assistants, teaching assistants)
   - Role/involvement of teachers
   - Role/involvement of parents/guardians (family)
   - Caseload size
   - Caseload selection and prioritization
   - Discharge or therapy discontinuation criteria
   - Types of scheduling models (e.g., block, frequency of contact, duration)
   - Governance (school versus health system based system)
   - Collaboration between health and education
   - Transitions
   - Access
   - Technology

## Step 2: Search and retrieval

### Library databases

The following database were searched:

- CINAHL
- EMBASE
- ERIC
- Ovid MEDLINE
- PsycINFO

Limits: 1994 to present; English language; preschool or school-age to 18 years

Search terms varied by database. General subject terms were:

- Speech-language pathology, speech therapy, communication disorders, speech or language impairments, phonology
- School or educational program, early childhood education, special education

- Delivery systems, administration, management, program effectiveness, program evaluation, decision making, program descriptions, program evaluation

Web-based databases

- Canadian Coordinating Office for Health Technology Assessment (CCOHTA) http://www.ccohta.ca
- Cochrane Database of Systematic Reviews (CDSR) http://www.health.library.mcgill.ca/database/cdsr.htm
- NHS Health Technology Assessment Programme http://www.hta.nhsweb.nhs.uk
- Turning Research into Practice (TRIP) http://tripdatabase.com

Professional Association Websites

- Alberta College of Speech-Language Pathology and Audiology http://www.acslpa.ab.ca
- American Speech-Language-Hearing Association (ASHA) http://www.asha.org/default.htm
- Canadian Association of Speech Language Pathologists and Audiologists (CASLPA) http://www.caslpa.ca/english/index.asp
- Royal College of Speech Language Therapists (RCSLT) http://www.rcslt.org
- Speech Pathology Association of Australia: http://www.speechpathologyaustralia.org

The library search was conducted in two waves. In wave 1, all databases were searched using the above subject categories. The titles and abstracts, where available, were reviewed individually to determine potential relevance. These were then retrieved.

Wave 2 involved a refinement of terms in order to ensure no relevant study articles were missed. Specific search terms were applied to the MEDLINE, PsychINFO and ERIC databases, as these had generated the most articles in wave 1. Approximately 30 additional articles were identified through this search.

Wave 2 specific search terms were:

- case management,
- caseload selection, patient selection, admission, prioritization, discharge, discharge criteria,
- caseload size, guidelines
- scheduling, block scheduling, treatment duration, time factors, resource allocation, health care rationing,
- accountability, governance,
- paraprofessionals, paraprofessional personnel, paraprofessional school personnel, teaching assistants, teacher aides,
- bilingual, multilingual, multicultural, continuity of treatment, continuity of care, continuity of service, transitions, transitional programs,
- group therapy, group treatment, individual treatment, pull-out treatment, pull-out therapy, collaboration, in-classroom intervention,
- treatment outcomes.

Study articles identified in the systematic reviews and determined to be directly relevant to the aspects under study were retrieved, regardless of year of publication.

### Step 3: Review of articles for inclusion

Articles retrieved in the literature search were screened to determine the ones that were (a) relevant to the search questions and aspects, and (b) to identify the type of article i.e. opinion versus study.

(a) Relevance: The following criteria were used to determine if articles were relevant for inclusion in the literature review:

- Article described at least one of the aspects identified in the search questions.
- Article described speech-language pathology services delivered directly by SLP or indirectly through teachers, parents or assistants. The latter must have been under the direction of a SLP.
- Article was applicable to pre-school, kindergarten or school-aged children. Articles pertaining to infants were excluded.
- Article must describe the organization of services – either a service delivery model or aspects of a service delivery model. Articles focusing on clinical practice were excluded.
- The orientation is population-based, i.e., population or sub-populations of ECS and school-aged children needing SLP. Articles describing interventions for individuals or small groups of individuals were excluded, unless they are reflecting a particular service delivery model.

(b) Type of article

In order to facilitate decision-making based on the highest levels of evidence, each relevant article was categorized into informed opinion or study article. Study articles were distinguished by study design.

- *Informed opinion*– these articles do not describe an original study. Methods and/or results are not described; however they may discuss a topic (e.g. pros and cons of various options), describe a model without any type of evaluation, or summarize the literature without systematically reviewing/analyzing the results.

- *Study* – these articles included descriptive studies, comparative studies and systematic reviews.

  (a) Descriptive studies - describe the methods and results of original studies, but they do not provide any comparison of outcomes of different interventions. This category includes a wide variety of study designs including: satisfaction surveys, comparisons of practice patterns or processes (but not outcomes) and case studies.

  (b) Pre-post single-subject designs – outcomes for a number of individuals are compared pre and post intervention.

  (c) Quasi-experimental studies – studies with control groups, not randomly assigned.

  (d) Randomized controlled trials (RCT) – study participants are randomized to receive different interventions and are compared for outcomes.

- *Systematic reviews or meta-analysis* - results from several original comparative studies are systematically compared or synthesized.

# Appendix B:

# Summary of Evidence-Based Articles on SLP Models

| Reference No./ Title/Country | Topic | Study Design | Study Population | Results/Conclusions | Comments |
|---|---|---|---|---|---|
| Bland, L. & Prelock, P. (1996)<br><br>Effects of Collaboration on Language Performance<br><br>United States | Collaboration – SLP/teachers versus pull-out service delivery.<br><br>This study examines "the connected discourse of school age students with communication disorders over time as they participated in a traditional pull out and/or collaborative LIC [language in classroom] model of service delivery. | Comparative study. Matched control pre-post design. Comparison of connected discourse in students with communication problems as they participated in LIC (language in classroom) versus pull-out model of service delivery.<br><br>**Intervention**<br>Group 1:<br>Inservice training: SLPs, teachers and students SLPs participated in seven 2-hr. training sessions.<br><br>Planning meetings: scheduled weekly or bimonthly.<br><br>LIC (Language In Classroom) sessions: 30/45 minutes per week where team focused on academic and communication objectives.<br><br>Group 2:<br>Pull-out therapy 1-2/week for 30-45 minute sessions.<br><br>**Outcome Measures**:<br>Language samples and analysis using Systematic Analysis of Language Transcriptions (SALT). Language samples collected every 6 months over a 3 year period. Samples obtained every 6 months over a 3-year period.<br>Analysis included:<br>• Complete/intelligible utterances.<br>• Incomplete/unintelligible utterances. | N=14 students<br><br>Seven pairs of students matched based on scores on the Clinical Evaluation of Language Fundamentals – Revised (CELF-R), age, and type of language problem.<br><br>Grades: 1 to 4<br><br>Age: 6-2 to 9-9 years<br><br>Other: Low income status | "SALT analysis revealed little difference in the subjects' language production" (p.34)...."overall the language performance of all subjects improved regardless of type of service delivery"(p.36).<br><br>For LIC students there was a significant increase in intelligible/complete utterances and a decrease in unintelligible/incomplete utterances.<br><br>No significant differences in intelligible/complete utterance or unintelligible/incomplete utterances were noted for students in the pull-out model.<br><br>"there were few differences noted in syntax, semantics or morphology for students served in a collaborative model as compared to students served in a pull-out model" (p.31) | Small sample size.<br><br>Authors note that "oral language sample has limitations for observation of change in the communication skills of school-age children. Further the method of analysis selected to examine the sample should take into consideration all aspects of language." (p.36).<br><br>Authors note that "it would be important to identify teacher behaviours which may help facilitate language growth in children" (p.36). |

| Reference No./ Title/Country | Topic | Study Design | Study Population | Results/Conclusions | Comments |
|---|---|---|---|---|---|
| Cleary P. & McFadden S. (2001)<br><br>Helping Children with Communication Difficulties in the Classroom<br><br>United Kingdom | Collaboration – SLP and teachers.<br><br>Aim was to enable project teachers to identify children with language difficulties, i.e. understand how and when to refer for SLP services, and implement support strategies in the classroom. | **Type**<br>Descriptive - pre-post survey of teachers. Evaluation took place after first year of a 2-year project.<br><br>**Intervention**<br>Schools invited to an information session and received an individual visit from SLP prior to project.<br><br>2 SLPs provided curriculum advisory and support services to 16 schools. The SLP "worked in the classroom alongside the class teacher and also offered some direct time support" (p.31).<br><br>SLP provided 12-15 visits during the school years.<br><br>**Outcome Measures**<br>Teacher questionnaire completed at the beginning of the project, after the first term and at the end of the school year. Questionnaire included structured and open-ended questions. Personal interviews were also conducted. | **Sample Size**<br>16 schools<br><br>**Condition**<br>Language difficulties<br><br>**Age**<br>Nursery, reception and primary one classes<br><br>**Setting**<br>Classroom | **Pre-project areas identified by teachers as requiring support (descending order):** strategies (100%), checklists (80%), modeling assessment (73%)t, team teaching (63%), resources (57%), and directed time (2.9%).<br><br>**Post-project areas ranked most useful in supporting teachers in class (descending order):** strategies and checklist (92%), resources (88%), modeling assessments (63%), teaching and directed time (46%).<br><br>**Referral to SLP**: Post-project responses were higher for all areas regarding referral to SLP services. | Authors note the following weaknesses: lack of in-service training offered, questionnaire was not detailed, interviews were not documented.<br><br>Authors also note that 50% of schools had a preference for weekly visits (as compared to biweekly).<br><br>Study includes students in nursery program. |
| Dockrell J. & Lindsay G. (2000)<br><br>Meeting the needs of children with specific speech and language difficulties<br><br>United Kingdom | Service delivery model<br><br>Multidisciplinary – SLPs, teachers, teacher assistants, psychologists.<br><br>Article describes "ways that children with SSLD [specific speech and language difficulties] present in mainstream educational settings" (p.24). | Descriptive – questionnaire followed by direct consultation with SLPs, psychologists, special educational needs coordinators and head-teachers in two local education authorities and their associated health trusts.<br><br>**Outcome Measures:**<br>Children's language difficulties, associated difficulties, educational difficulties, social and behavioural difficulties, provision being made for children | N=133 identified children with specific speech and language difficulty (SSLD).<br><br>Gender: 96 boys and 37 girls<br><br>Age: 7 - 8 years old<br><br>Other: 90% had English as their first language. | *Educational difficulties* noted in children with SSLD:<br>48.9% writing problems;<br>82.7% reading problems;<br>86.5% spelling problems;<br>61.7% math problems.<br><br>*Social and behavioural difficulties* noted in children with SSLD:<br>64.7% confidence problems;<br>48.1% self-esteem problems;<br>30.1% behaviour problems.<br><br>*Provisions Being Made for Children*:<br>SLPs involved primarily with individual children (16.5%), 2.3% received SLP support in group or in class. | "Data highlight the range and diversity of the needs of children with specific speech and language difficulties and the need for a multi-professional approach to these children" (p.25).<br><br>Authors note that "inclusive education for children with SSLD requires provision which is planned and delivered by a combination of professionals including SLTs [speech-language therapists], in particular, as well as teachers, support assistants and EPs [educational psychologists]."(p.38). |

| Reference No./ Title/Country | Topic | Study Design | Study Population | Results/Conclusions | Comments |
|---|---|---|---|---|---|
| Dohan M. & Schulz H. (1998)<br><br>The Speech-Language Pathologist's Changing Role: Collaboration Within the Classroom<br><br>Canada | SLP/Teacher Collaboration<br><br>Article describes "Canadian SLPs' collaboration with teachers within the classroom, focusing on use and judgements of classroom-based interventions" (p.11). | Descriptive. 33-item questionnaire mailed to school SLPs regarding 7 service delivery approaches for classroom intervention. The questionnaire had the following 3 sections:<br>Section 1: background information<br>Section 2: "use and perceived success of seven classroom-based intervention approached with four disorder types (i.e., language, articulation, fluency, and voice) and with students in four grade level categories (Kindergarten to Grade 3, Grades 4 to 6, Grades 7 to 9, Grades 9 to 12)" (p.11).<br>Section 3: advantages and disadvantages of class-room based intervention approaches.<br><br>Seven levels of classroom-based interventions range from least collaborative (approach 1) to most collaborative (approach 7). | N=253 SLPs (82% response rate).<br><br>SLPs identified through national and provincial association membership lists.<br><br>Random samples taken from larger provinces.<br><br>Weighting process used to "ensure that the sample did not overrepresent smaller provinces and provinces with higher return rates or underrepresent larger provinces and provinces with lower return rates" (p.12). | **General Use of Approaches –**<br>Approach 1 - 76%; Approach 2 – 63%; Approaches 3 to 7 – 19% to 34%<br><br>**Use of Approach with Disorder Type –**<br>Language Disorders – Approach 1 (73%), Approach 2 (62%), Approaches 3 to 7 (19% to 34%).<br>Articulation Disorders: Approach 1 (41%), Approach 2 (28%), Approaches 3 to 7 (7 % to 11%).<br>Fluency Disorder: Approach 1 (26%), Approach 2 (16%), Approaches 3 to & (3% to 5%).<br>Voice Disorder: Approach 1 (19%), Approach 2 (13%), Approaches 3 to 7 (3% to 5%).<br><br>**Success of Approach with Disorder Types**<br>"Approaches Three, Five, Six and Seven received higher percentages of "good" ratings for all four disorder types, 73% or more, than did the other three approaches. However these results should be interpreted with caution due to small numbers...." (p.13).<br><br>**Use of Approach with Grade Level Categories**<br>K to Grade 3: Approach 1 (73%), Approach 2 (60%), Approaches 3 to 7 (20% to 31%).<br>Grades 4 to 6: Approach 1 (47%), Approach 2 (37%), Approaches 3 to 7 (12% to 19%).<br>Grades 7 to 9: Approach 1 (19%), Approach 2 (12%), Approaches 3 to 7 (3% to 9%).<br>Grades 10 to 12: Approach 1 (11%), Approach 2 (6%), Approaches 3 to 7 (1% to 5%).<br><br>**Success of Approach with Grade Level Categories**<br>K to Grade 3 and Grades 4 to 6: Overall rated success as good for 60% to 95% of respondents.<br>Approaches 4,5,6,7, - largest percentages of good ratings.<br>Grades 7 to 9 and Grades 10 to 12: Success less likely to be rated as good. | Authors note that "results of this study are consistent with published reports on the use of classroom-based approaches by SLPs, which indicate that these approaches are most often used with younger students who have language disorders" (p.16). |

| Reference No./ Title/Country | Topic | Study Design | Study Population | Results/Conclusions | Comments |
|---|---|---|---|---|---|
| Drew M.F. (1998)<br><br>Speech and language therapist-teacher collaboration in a literacy summer school<br><br>United Kingdom | Transition – summer school for students entering secondary school.<br><br>Collaboration – SLP and teacher.<br><br>Article describes collaboration between a SLP and special needs teacher "to provide an intensive phonic-based programme of reading and spelling instruction in the context of a literacy summer school for students about to enter secondary school" (p.581). | Evaluation of students' reading and spelling pre and post instruction in summer school.<br><br>**Intervention**: SLP and special needs teacher provided "language enrichment sessions with special emphasis on comprehension and learning skills" (p. 581). Literacy instruction was provided using a phonics based program developed by the special education teacher, *Everyone Can Read*.<br><br>**Outcome Measures:**<br>Schonell word reading and spelling tests and Group Reading Test II (GRT II). | **Sample**: N=32 students<br><br>**Age**: 6 years 9 months to 12 years 6 months | *Reading*: 28/32 students "improved their reading ages by between 1 and 35 months" (p.583); 8 of these students improved by 12+ months; 10 improved by 6 to 11 months" 10 improved by between 1 to 5 months. No improvement noted for 2 students and a decrease noted for 2 other students.<br><br>*Spelling*: 21 students improved spelling age from 1 to 18 months; 2 students showed no improvement; 4 students decreased spelling ages by 2-4 months. | Authors note that "various factors, such as innate language ability, attendance, completion of homework and age, appeared to contribute to the degree of improvement of individual students" (p.582). |
| Farber, J. & Klein, E. (1999).<br><br>Classroom-Based Assessment of a Collaborative Intervention Program with Kindergarten and First-Grade Students<br><br>United States (Philadelphia) | Collaboration - SLP and teacher .<br><br>Purpose of study "was to identify kindergarten and first grade students with language-learning difficulties and develop a series of support programs to increase teacher-therapist collaborative intervention, increase parental support and improve students' performances using cross-age peer tutors" (p.85).<br><br>Intervention program used is Maximizing Academic Growth by Improving Communication (MAGIC) | **Type**<br>Randomized controlled trial. 2 treatment groups and 1 control group.<br><br>**Intervention**<br>Treatment Group 1: SLP-teacher collaborative intervention 3x/wk (2.25hrs/wk); SLP/teacher support workshop prior to program (5 hrs); Parent workshop (5 hrs).<br><br>Treatment Group 2: SLP-teacher collaborative intervention 3x/wk (2.25hrs/wk).<br><br>Control: Consisted of regular education program with no additional support services.<br>Controls matched to treatment groups.<br><br>**Outcome Measures**:<br>Pre and post testing using: MAGIC Language Test; Teacher Questionnaire of Student Language Abilities. Both tests developed by School District of Philadelphia. | **Sample size**<br>N=552 children from 12 classrooms in six elementary schools.<br><br>**Age/Class:** K and Gr. 1<br><br>Treatment Group 1:<br>n=273<br>141 K; 132 Gr. 1<br><br>Treatment Group 2:<br>N=46<br>20 K; 26 Gr. 1<br><br>Control Group:<br>N=253<br>126 K; 107 Gr. 1 | "Results indicated that weekly classroom intervention resulted in significantly higher scores on the subtests of listening and writing for the children involved in the MAGIC program.<br><br>Students in the treatment groups demonstrated significantly higher abilities in understanding vocabulary and cognitive-linguistic concepts in addition to increased writing skill development for producing relevant sentences with correct mechanics and spelling" (p.83). | |

| Reference No./ Title/Country | Topic | Study Design | Study Population | Results/Conclusions | Comments |
|---|---|---|---|---|---|
| Elksnin, L.K., and Capilouto, G.J. (1994).<br><br>Speech-Language Pathologists' Perceptions of Integrated Service Delivery in School Settings<br><br>United States | Collaboration - SLPs and teachers<br><br>Articles presents results of a survey of SLPs "who had adopted or were considering adopting integrated speech and language services in a school setting" (p.258). | **Topic**<br>Descriptive survey of SLPs perceptions of integrated service delivery.<br><br>**Measures**<br><br>SLPs "perceptions of their expertise and the expertise of classroom teachers, integrated service delivery approach they had adopted, the types of speech and language services provided in the classroom, and the characteristics of students served" (p.258).<br><br>Survey contained checklists, rating scales and open-ended items.<br><br>The section on integrated service delivery was categories into the following 7 approaches: one teach, one observe; one teach, one "drift"; station teaching; parallel teaching; remedial teaching; supplemental teaching; and team teaching. | **Sample**<br>n = 31 SLPs<br>18 Adopters (SLP's who had used integrated service delivery) and 13 nonadopters.<br><br>93% of SLPs possessed a master's degree or higher. | **Integrated Services**<br>100% adopters use integrated approach for language and articulation; 16.7% for fluency 5.6% for voice.<br><br>100% non-adopters willing to use integrated approaches for language; 38.5% for articulation, 23.1% for fluency, and 7.7% for voice.<br><br>Models of integrated service delivery mostly frequently used by adopters included: one teach, one drift (83.3%); teach teaching (80.0%); and one teach, one observe (72.2%).<br><br>**Characteristics of Students Served**<br>"Adopters primarily provided integrated services to preschoolers and elementary-aged students, and to a much lesser degree to middle and high school students. Nonadopters had similar perceptions" (p.261).<br><br>**Factors Contributing to Effective Integrated Service Delivery**<br>Adopters and nonadopters – strongly agree that SLPs and teachers need "knowledge and skills that were valued, time to plan, and administrative support" (p.262).<br><br>**Advantages of Integrated Service Delivery**<br>Carryover of skills, elimination of pull-out, increased exposure to language activities.<br>**Disadvantages**<br>Additional time planning, difficult to incorporate IEP goals, lack of individualization for caseload students, noncaseload students may become bored.<br><br>**Training Needs**<br>Preference for inservice (43.8%) sessions or conferences (35.5%). | Authors note "limitations of this study are the small sample size and restricted geographic generalizability". |
| Fletcher M. (1998)<br><br>Collaboration in Glasgow's Primary School Language Units<br><br>Scotland (Glasgow) | Collaboration – SLP and teachers.<br><br>Aim of project is to determine "how much collaboration is taking place within the areas of assessment, planning, teaching, evaluating and reporting discussed in the 5-14 Curriculum Guidelines (The Scottish Office 1993)...and determine the quality of the collaborative relationships..." (p. 575). | **Type**<br>Descriptive – survey and interviews with SLPs and teachers.<br><br>**Outcomes Measures**<br>Structures in Collaboration: Frequency of collaboration in assessment, planning, teaching, language work, evaluation and reporting.<br><br>Collaborative relationship: Quality of collaborative relationship using the scale by Bruce (1980) of "nominal co-operation, convenient co-operation and committed co-operation" (p. 275). | **Sample size:** n=21 teachers and SLPs.<br><br>Questionnaire sent to entire population of 15 teachers and 6 SLPs in Glasgow's four primary school language units.<br><br>Semi-structured interviews with 5 teachers and 3 SLPs, following questionnaire. | **Structures in Collaboration**: Frequent collaboration (>50% of time) reported as follows: assessment 7/21; planning 16/21; teaching 9/21; language work 11/21; evaluation 11/21; reporting 10/21.<br><br>**Collaborative relationship:**<br>*Role of SLP*: "interview data suggest many facets to the role of the SLT [SLP] but...there seems to be little cohesion among the SLTs and teachers as to what that role is" (p.578).<br><br>*Role of Teacher*: Teachers did not describe a role for themselves beyond delivering the curriculum and classroom management. "By contrast, the SLTs [SLPs] all talked about a wider role for the teachers, particularly in relation to carrying out joint aims to develop the pupils' language skills" (p.578). | Small sample size, particularly for interviews. |

| Reference No./ Title/Country | Topic | Study Design | Study Population | Results/Conclusions | Comments |
|---|---|---|---|---|---|
| Hadley, P., Simmerman, L., Long, M., & Luna, M. (2000)<br><br>Facilitating Language Development for Inner-City Children: Experimental Evaluation of a Collaborative, Classroom-Based Intervention<br><br>United States | Collaboration - SLP and teacher<br><br>"article reports on the effectiveness of a collaborative service delivery model, teaming a speech-language pathologist with regular educators to facilitate English language development for inner city children with limited communication skills" (p.282). | **Type**<br>Randomized controlled trial.<br><br>4 teachers randomly selected for participation. Children randomly assigned to classrooms; 2 classrooms selected as controls (standard practice classrooms); 2 classrooms received collaborative service delivery model intervention.<br><br>**Intervention**:<br>Collaborative service delivery consisted of: professional education, joint curriculum planning, and vocabulary and phonological awareness instruction. SLP taught in each experimental classroom for 2.5 days/week.<br><br>Control condition – teachers followed existing curricular plans; an extra paraprofessional was assigned to maintain same adult-to-student ratio as experimental condition.<br><br>**Outcomes Measured**:<br>Pre and post testing completed on students in all 4 classrooms. Testing included: "two standardized tests of vocabulary abilities, three measures of phonological awareness, and a letter-sound association task" (p.285).<br><br>**Study Period**: 6 months | **Sample size** – 86 students<br><br>**Age**<br>2 kindergarten classes and 2 kindergarten-grade1 classes, age 5.0 – 6.9 years.<br><br>**Gender**<br>46 boys and 40 girls<br><br>**Other**<br>35/86 (41%) identified as having Limited English Proficiency (LEP).<br><br>Native languages were English (39.6%), Spanish (46.5%), and other. | **Pre-test**<br>No significant difference in pre-test scores for the experimental and control groups.<br><br>**Vocabulary:**<br>"The estimated marginal means indicated that the experimental group scored 7.36 and 8.17 standard score points higher than the control group on the PPVT–III [Peabody Picture Vocabulary Test] and EVT [Expressive Vocabulary Test]" (p.288).<br><br>"Students in the experimental classrooms scored significantly higher than the students in the control classrooms after adjusting for pretest scores and grade" (p.288).<br><br>**Phonological Awareness:**<br>Rhyme: No difference between experimental and control conditions.<br>Beginning Sound awareness: Significant differences.<br>Letter-sound associations: Significant differences.<br>Syllable deletion: Significant effect for experimental condition.<br>Phoneme deletion: Marginal effect for experimental condition. | Authors note that these results support positive benefits of collaboration in facilitating the language abilities of inner-city children who are at risk for academic difficulties in the early elementary grades" (p. 280).<br><br>Author's note that experimental classrooms showed improvement in deletion task although this skill was not specifically targeted during intervention; thus indicating a generalization effect.<br><br>Use of a full time SLP for 2 classrooms is a luxury. Plan was to scale back intensity once approach was in place.<br><br>Small sample size made it difficult to interpret results in phonological awareness. |

| Reference No./ Title/Country | Topic | Study Design | Study Population | Results/Conclusions | Comments |
|---|---|---|---|---|---|
| Hirst E. & Britton L.<br>(1998)<br><br>Specialised Service to Children with Specific Language Impairments in Mainstream Schools<br><br>United Kingdom | Service delivery model.<br><br>Collaboration – SLPs and teachers<br><br>Aim of this 3 year project was to develop, implement and evaluate SLT services to children with language impairment attending mainstream schools and nurseries.<br><br>"The package of care aimed to facilitate a close working relationship between the SLT [SLP] and education to enable the optimum integration of professional skills to meet the child's educational and communication needs. | **Type**<br>Descriptive study – questionnaire/rating scale used to obtain school and parent satisfaction and outcomes. Descriptive information regarding process/activity levels.<br><br>**Intervention**:<br>SLP worked with teacher and key-worker to develop and implement specific program activities/strategies to teach new skills; to facilitate effective communication; and to adapt educational environment to aid social integration and access to curriculum.<br><br>SLP conducted follow-up visits.<br><br>Parents encouraged to follow up at home.<br><br>**Outcome Measures**<br>Process – measured by activity audit and clinical data analysis.<br><br>Satisfaction – Parents and school responded to 7 quality parameters as positive, neutral or negative.<br><br>Outcomes - measured using parental rating scale and therapist ratings of effectiveness. | **Sample:** 34 school and parent questionnaires, and 34 therapist ratings and 14 parent ratings completed.<br><br>**Inclusion criteria**<br>60 children received the package. 39 were seen for 2+ terms and were included for evaluation. Questionnaires completed for these candidates. | **Process**<br>"average length of session per child was two hours (much longer than traditional clinic-based therapy)" (p.595).<br><br>**Satisfaction**<br>*Amount of support from SLP*: 48% neutral responses from parents; 97% positive responses from school.<br>*Ease of contact with SLP*: 92% positive responses from parents; 100% positive responses from schools.<br>*Involvement in SLP process*: 61% positive responses from parents; 96% positive responses from schools.<br>*Appropriateness of SLP*: 93% positive responses from parents; 73% positive responses from schools.<br>*Amount of benefit to child*: 100% positive response from schools; parents (not rated).<br>*Progress by child*: 96% positive response from parents; schools (not rated).<br>*Benefit to adults*: 100% positive rating from school; parents (not rated).<br><br>**Outcomes:**<br>*Parental perception of change*. The majority of parents rated improvement in 8/11 outcome measures. These included: severity of communication difficulty, parent's ability to understand child; child's confidence; child's communicative effectiveness; talking to new people; child's frustration; parent's frustration; effect on school performance.<br><br>50% reported improvement in mixing with other children and parents' understanding of child's difficulty.<br><br>Majority rated no change in parent's management of child's difficulty.<br><br>*Therapist ratings of outcomes*: Majority of therapists rated improvement in 8/8 outcome categories. These included: change in child's skills, confidence to communicate, communicative effectiveness, appropriateness of aims, appropriateness of level of input; level of training and support for keyworker/teacher, and school's view of ability to meet child's needs. | Authors note that "the package of care offered provided an effective and high quality service as judged by the parents, schools and therapists" (p.593).<br><br>Authors summarize that: " the school based package of care was perceived as a high quality service by schools, parents and carers" (p.595).<br><br>Authors note that "parental ratings indicated that all fourteen children had made progress in response to school-based therapy" (p.596).<br><br>Parental involvement not well described.<br><br>Small sample for outcomes.<br><br>Evaluation measures are not well-described. |

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| King G.A. et al. (1999)<br><br>An Evaluation of Function School-Based Therapy Services for Children with Special Needs<br><br>Canada (Ontario)<br><br>**X-reference**<br>King G.A. et all (1998)<br>The Evaluation of Functional, School-Based Therapy Services for Children with Special Needs: A Feasibility Study [Article describes the feasibility study that was a precursor to this study]. | Service delivery model for children with special needs at Thames Valley Children's Centre.<br><br>Multidisciplinary approach.<br><br>Collaboration between SLPs, teachers, parents.<br><br>"aim of study was to examine the utility of school-based program providing multidisciplinary therapy services to children with diverse needs…a comprehensive assessment of outcome was obtained by using both goal attainment scaling* (an individualized approach) and standardized measures" (p.8).<br><br>• Goal attainment scaling (GAS) is a criterion-referenced measure of individual goals. | **Type**<br>Comparative study; pre and post evaluation of children<br><br>**Intervention**: The service delivery model "incorporated a mix of direct therapy, monitoring and collaborative consultation delivered according to a family-centered, functionally-oriented approach" (p.25).<br><br>Study involved pre-therapy data collection, 6-month intervention (exception for those with fine motor difficulties, post-therapy assessment and follow-up assessment 5-6 months later.<br><br>**Measurement**<br>3 evaluation points: pretest, posttest, and 5-6 months follow-up. Change measured by goal attainment scaling, standardized measures of functional status, and parent and teacher satisfaction.<br><br>Communication measured by AAPS [Arizona Articulation Proficiency Scale] and sections of the Vineland Adaptive Behavior Scales – Classroom Edition].<br><br>**Study Period:** 1997-98 and 1998-99 school years. 6-month intervention period. | **Sample**<br>n=50 children with special needs.<br><br>24 therapists (SLPs, PTs, and OTs).<br><br>16/50 children had speech-language goals in communication; 21/50 Occupational therapy goals in productivity; 13/50 physical therapy goals in mobility.<br><br>Questionnaire response rate by parents (78%) and teachers (92%).<br><br>**Age**<br>5-12 years<br><br>**Gender**<br>24 girls and 26 boys<br><br>**Grade**<br>K to Gr. 6 | Goal Attainment Scaling: " From pretest to posttest, 98% of children made improvement on their goals" (p.18).<br><br>Standardized Communication Measures: Articulation – significant improvement from pretest to post test on the total score of the AAPS which was maintained at follow-up.<br><br>Statistically significant improvement from pretest to posttest and pretest to follow-up noted in Communication domain of the Vineland.<br><br>Parent and Teacher Satisfaction:<br>Average ratings by parents and teachers were 3.4 and 3.5 (4-point scale), indicating they were "highly satisfied with the services" (p.22).<br><br>Parent and teacher ratings (means scores) on satisfaction with therapy intervention were 5.4 and 5.5 (7-point scale) respectively; and ratings on satisfaction with therapists' communication were 5.4 and .5.7 respectively. | Authors note: "Study found statistically significant and often clinically significant improvement in the mean functional status and individual goal attainment of children receiving speech-language, occupational and physical therapy, as measured by standardized measures and goal attainment scaling, respectively. These improvements were maintained at a five- to six-month follow-up…" (p.23).<br><br>"findings suggest that speech-language, occupational, and physical therapy in the schools led to functional improvements in communication, school productivity, and mobility" (p. 23).<br><br>A relatively small number of actual sample were SLP cases (16/50). |

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| Law J. et al (2002 June)<br><br>Consultation as a model for providing speech and language therapy in schools: a panacea or one step too far?<br><br>United Kingdom (London) | Collaboration – SLP and teachers | **Type**<br>Descriptive - viewpoints derived from interviews and meetings.<br><br>**Intervention**<br>Phase 1 – questionnaire re current service provision<br><br>Phase 2 – Local Education Authority and health trust pairs targeted for site interviews. Analysis completed at managerial, practitioner and parental levels.<br><br>Phase 3- 5 meetings of managers, practitioners and parents across England and Wales. | Phase 2 – teachers and SLPs interviewed. SLPs interviewed in groups of 2-6 people in 15 sites.<br><br>Phase 3 – 5 locations selected for meetings; attendance limited to 40 in 4 locations and 80 in London. | 'Consultation' means different things to different people.<br><br>**Resources** – "allocation of resources affects the model of service provision…level of staffing and the skill mix of those in the service" (p.151).<br><br>**Management of services –** "clinic/school debate involves balancing the interests of individual children with those of the cohort of children needing therapy" (p.152)<br>"Liaison, training and continuing professional development and assessment are all key features of the service provided by speech and language therapists irrespective of the specific approach…need to be part of the package of care" (p.153).<br><br>**Caseload** – "an indirect model of working appears to be a pragmatic solution to the problem of coverage" (p.154).<br><br>**Conditions** – team needs to meet on a regular basis; need to train SLP assistants; need to identify role of assistants<br><br>**Equity of provision** – recognition that services are not equitable; not all children with need have been identified and have statements of special educational assistance; geographical discrepancies.<br><br>**Staff well-being** –Historically SLPS trained to do direct therapy; Redefining role of SLP goes beyond 'comfort zone'.<br><br>**Parental satisfaction** "indirect/consultative model was simply a cheap way of providing services" (p.157).<br><br>**School satisfaction** – opposition to clinical model used in schools.<br><br>**Level of service provision-** "consultancy model offers the potential to increase the coverage of SLT provision by making creative use of the range of skills that are already available in the school" (p.158). | Results expressed in subjective format.<br><br>No indication of numbers or themes that arose from interviews, meetings.<br><br>No specific information provided about the interview, e.g. interview guide questions.<br><br>Exact number of participants not included. |

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| Pershey M.G. & Rapking C.I. (2003)<br><br>A Survey of Collaborative Speech-Language Service Delivery Under Large Caseload Conditions in an Urban School District in the United States<br><br>United States | Collaboration – SLP and teachers.<br><br>Pull-out/direct treatment<br><br>Purpose of study is to "describe SLPs' responses to a survey about collaborative service delivery in an urban school district in the United States of America" (p.213). | **Type**<br>Descriptive –15-item survey related to "caseload description, aspects of collaboration, and self-impressions of teacher and parent satisfaction" (p.214).<br><br>Items were mostly forced-choice items and some open-ended questions.<br><br>**Outcome Measures**<br>SLP contributions to reading and writing curriculum and instruction<br><br>SLP's impressions of teacher satisfaction with collaborative service delivery<br><br>SLP's self-perceptions of the impact of collaborative service delivery" (p.211).<br><br>**Time**: Spring 2000 | **Sample size**: 17/42 (40.5% response rate) SLPs working in an urban school district<br><br>SLPs had state teacher certification.<br><br>**Condition/Disorder**<br>Literacy<br><br>**Setting**<br>School district has 82 schools. 67.4% of student population were minority students. | **Contribution to Reading/Writing**<br>*Consultation*: Responses agreeing with 4 statements in this category ranged from 5/17 to 12/17.<br>*Cross-Disciplinary Goal Setting*: Responses agreeing with 2 statements in this category ranged from 14/17 to 16/17.<br>*Incorporating Reading and Writing into Therapy*: Responses agreeing with 2 statements in this category were 7/17 and 7/17.<br>*Phonological Awareness Inservicing*: Responses agreeing with 2 statements in this category were 4/17 and 1/17.<br>*Programmatic Input*: Responses agreeing with 4 statements in this category ranged from 0/17 to 3/17.<br><br>**SLP Impressions of Teacher Satisfaction with Collaborative Service Delivery**<br>9/17 SLPs perceived teacher with whom they collaborate as giving them a satisfactory rating and 2/17 as unsatisfactory.<br>10/17 SLPs noted that teacher(s) expressed desire to continue collaboration; 0/17 for discontinuing collaboration.<br><br>**Self-Perceptions of Impact of Collaborative Service Delivery**<br>*Consultation*: Responses agreeing with 3 statements ranged from 2/17 to 12/17.<br>Reading/Writing Services: Responses agreeing with 3 statements ranged from 4/17 to 7/17.<br>*Comments from Parents*: 6/17SLPs reported that parents noted that SLP intervention helped at least 1 student. | Authors note that: "SLPs sporadically incorporate some aspects of collaboration into their professional practices" (p. 218).Teamwork frequently reported in IEP planning.<br><br>SLPs perceive teachers as satisfied with collaborative efforts.<br><br>SLPs perceive themselves as having impact when collaborative service delivery is used in conjunction with pull-out speech-language therapy.<br><br>According to authors, "large caseload size, elements of teacher resistance, and the absence of SLPs from regular education curriculum planning committees forestall attainment of collaborative service delivery….SLPs and teachers may be unsure of their respective roles and responsibilities in collaborative partnerships" (p.211).<br><br>Study only surveyed SLPs and not teachers.<br><br>Small sample size |

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| Reid J. (1996 October)<br><br>Pupils with Special Educational Needs: The Role of Speech & Language Therapists<br><br>United Kingdom | Service delivery model<br><br>Collaboration/Multi-discliplining<br><br>Role/use of parents<br><br>Article describes "speech and language therapy needs of pupils with special educational needs; forms of collaboration among parents and professionals; and the perceived effectiveness of different ways of providing speech and language therapy" (p.2) | Descriptive study involving questionnaires, school visits and interviews of SLPs, SLP managers, teachers, principals, psychologists and special education advisors and parents.<br><br>**Measures**:<br>Questionnaire: quantitative and qualitative data sent to SLPs, SLP managers, teachers, principals, psychologists and special education advisors and parents.<br><br>School visits: 20 visits<br>Interviews: head teachers, class teachers, learning support teachers, specialist teachers, classroom assistant, parents and SLPs.<br><br>**Time period**: December 1993 to April 1995. | Sample size:<br>Interviews: "over 80 individuals".<br><br>Questionnaires: 381 SLPs | The following comments regarding the results of this study are as follows:<br><br>"study found evidence of collaborative practice among parents, SLTs [SLPs], teachers and other staff both in mainstream and in special educational facilities" (p.43)<br><br>"Survey results showed that, particularly in mainstream schools, a majority of SLTs provided only a 'traditional', withdrawal-based style of therapy, while teachers saw themselves as having little responsibility for meeting the needs of pupils with speech, language and communication difficulties" (p.43).<br><br>"The need for more supportive educational iput and enhanced speech & language therapy provision at secondary school level was emphasized" (p.43).<br><br>"effective collaboration required a shared perspective of common goals and the existence of appropriate resources ,conditions which do not always apply in all schools" (p.43). | Response rates and sample size not specifically reported.<br><br>No quantitative analysis performed on results. |

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| Throneburg, R. et al (2000 February)<br><br>A comparison of Service Delivery Models: Effects on Curricular Vocabulary Skills in the School Setting<br><br>United States | Service delivery model<br><br>Collaboration – SLP and teacher<br><br>Pull-out services<br><br>Articles described findings regarding a study of "growth of curricular vocabulary skills for school-age children attending kindergarten through third grade who participated in three service delivery models" (p.11). | Comparative study of children in grades K to 3 exposed to three different service delivery models: collaborative, classroom-based and traditional.<br><br>**Intervention**<br>*Collaborative Setting*: Involved the SLP, teacher and student SLPs. Involved in planning collaborative language lessons, regularly scheduled collaboration meetings during the semester (40 min/week), and collaborative lessons conducted in classroom with the teacher, SLP and SLP students. Additional small group and pull-out services to target specific goals.<br><br>*Classroom-Based Setting: (Teacher-SLP independent services)*: One classroom per grade (K-3) randomly assigned to classroom-based or traditional service delivery model. SLP provided classroom intervention without collaboration with the teacher. Language lessons provided for 40 min/week. Children requiring speech and language services received small group and pull out services (15min/week).<br><br>*Traditional Setting (SLP Pull-Out, Teacher Classroom)*. Vocabulary instruction by teacher, only. Children requiring speech and language services received small group and pull-out services (50 min/week). Children in 4 traditional classrooms that did not require speech and language services served as the control group.<br><br>**Outcome Measures**:<br>Pre and post testing of 20 vocabulary words for K -3 as measured by the following three tasks: verbal definitions; using the word in a sentence; and recognizing the word's meaning in a multiple choice task.<br><br>**Time Frame**: 12 weeks. | 12 classrooms located in 2 schools in central Illinois.<br><br>**Sample:** n=177 children<br>Collaborative setting: n=74<br>Classroom setting: n=60<br>Traditional setting: n=43<br><br>**Grades**:<br>K – Collaborative (n=19), classroom (n=14) and traditional (n=11).<br>Gr 1- Collaborative (n=16), classroom (n=17) and traditional (n=11).<br>Gr. 2 – Collaborative (n=16), classroom (n=12) and traditional (n=9).<br>Gr. 3 – Collaborative (n=23), classroom (n=17) and traditional (n=12).<br><br>**SLP students**: Number of students requiring SLP services were as follows:<br>Collaborative setting:12/74<br>Classroom setting: 11/60<br>Traditional setting: 9/43<br><br>Students requiring SLP services displayed mild-moderate speech and/or language impairments.<br><br>**Other**: Primarily Caucasian children; lower-middle to middle socioeconomic status. | **Pre-test scores**: indicated no significant difference between students in the collaborative, classroom-based and pull-out groups.<br><br>**Post-test scores**:<br>*Students with SLP impairment*: "substantially greater gains" made in collaborative setting (test gain=19 points), versus classroom-based (12 points) or traditional setting (13 points). "Collaborative setting's test gains were significantly higher than both the classroom-based setting and pull-out setting. There was no significant difference between the classroom-based setting and the pull-out setting" (p.15).<br><br>*Students with no SLP impairment*: Tests gains were significantly higher for those students in the collaborative and classroom-based groups as compared to the traditional setting. No significant difference noted between collaborative and classroom-based groups. | Authors summarize the following two findings:<br><br>"collaborative model was more effective for teaching curricular vocabulary to students who qualified for speech or language services [as compared to classroom-based or traditional model] ….and SLPs can have an impact on the vocabulary growth of all students in classrooms… when using a collaborative or classroom-based service delivery model" (p.16). |

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| Valdez F. & Montgomery J.K. (1997)<br><br>Outcomes from two treatment approaches for children with communication disorders in Head Start. | Inclusion vs pull-out service delivery models<br><br>Purpose of study "to determine if there was significant difference in treatment outcome between the traditional pull-out model and inclusionary model of service delivery for young children with communication disorders" (p. 66) | RCT: classroom and pull-out models of language "concept" intervention.<br><br>Classroom Intervention Group: consisted of 2 groups whereby children received classroom intervention with 10-15 peers.<br><br>Pull-out Group: consisted of 2 groups whereby children received pull-out group treatment.<br><br>Intervention:<br>Children received "concept" treatment for 90 minutes per week for a six-month period.<br><br>Measures: Pre testing and post-testing (6-months after intervention) using CELF-Preschool. | N= 40 children; 20 in each group.<br>Age: 3-5 years<br><br>Other: subjects selected from a group of African American Head Start children | Results revealed "no significant clinical differences between the inclusion group and the pull-out group in total language scores, receptive language scores and expressive language scores" (p. 67).<br><br>Overall, children in both groups showed made the greatest gains in the following subtests: Basic Concepts, Linguistic Concepts, and Word Structure.<br><br>The authors noted superior results in receptive language gains in the individual pullout treatment group when compared with the classroom intervention group. | Authors conclude that "the inclusion model is just as effective as a traditional pull-out model in conducting speech/language services for children with mild, moderate and severe communication disorders" (p. 65). |
| Wilcox et al. (1991)<br><br>Early language intervention: A comparison of classroom and individual treatment | Classroom vs individual intervention<br><br>Study "examined the relative effectiveness of interactive modeling in classroom versus individual treatment contexts" (p. 50). | RCT Individual vs classroom-based early intervention programs.<br><br>Group 1: individual treatment for 45 minutes 2X/weekly.<br><br>Group 2: classroom treatment during morning 9:00-12:00, 2X/weekly.<br><br>Intervention: "intensive modeling of target lexical items within the context of an ongoing activity". Intervention in classroom provided by teacher and SLP. Individual treatment provided by student SLPs.<br><br>Measures:<br>Number of words used productively in spontaneous speech.<br><br>Measurements conducted mid-treatment and post-treatment. | N=20 children with language delays.<br><br>Age: 20-47 months | Results revealed no significant differences in use of target words for children in individual vs. classroom intervention.<br><br>The authors found significantly superior generalization of expressive language gains to the home setting for children in the classroom-based model, as children made greater use of target words in the home. | Authors conclude that "a more naturalistic training environment results in better generalization to untrained environments".<br><br>Authors note "children in classroom condition participated in a broader range of multipurpose activities than did children in the individual treatment condition" (p. 57). |

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| Wren, Y., Roulstone, S., Parkhouse, J., & Hall, B. (2001)<br><br>A model for a mainstream school-based speech and language therapy service<br><br>United Kingdom | Service delivery model in UK-Withywood Speech and Language Therapy (WiSaLT project).<br><br>SLP and teacher collaboration<br><br>Key features of WiSaLT:<br>Funded by 7 schools with some additional funding from local health authority.<br>Outcomes based model.<br><br>Mission of project:<br>SLPs to "support education staff in the delivery of the curriculum to children with speech and language difficulties and will provide speech and language therapy expertise and intervention within the school context. | **Type**<br>Pre-post study of WiSaLT project intervention.<br><br>**Outcome Measures**<br>Outcomes established based on 4 "bases of need" including:<br>Child-based outcomes;<br>Class-based outcomes<br>Teacher/therapist-based outcomes;<br>School-based outcomes.<br><br>3 evaluation points:<br>Time 1: Prior to project (1996);<br>Time 2: Beginning of project (1997);<br>Time 3: End of 2 year project.<br><br>Questionnaires "given to a sample of teaching staff to evaluate their perceptions of children's self-esteem and access to the curriculum" (p. 113). | **Sample**<br>N=23/98 students available for post-testing.<br><br>48/63 (76%) returned teacher questionnaires. | **Child-based outcomes**<br>Phonology: 9/11 children "from the phonological and expressive language groups, who received therapy which focused on their phonological difficulties alone, showed greater improvement in their phonology during the treatment period compared with the control group" (p.114).<br><br>*Expressive Language*: 4/9 "children in the expressive language group showed greater improvement in their expressive language grammar scores following the intervention period compared with following the control period" (p.114).<br><br>*Receptive Language*: Results not available.<br><br>Questionnaire revealed improvement in student's self-esteem and classroom participation.<br><br>**Class-based outcomes**<br>Teacher's reported improved understanding of communication difficulties;<br><br>**Teacher/therapist-based outcomes**<br>"some teachers had become more confident in which children to refer to therapists, and therapists were more aware of educational issues" (p.120).<br><br>**School-based outcomes**<br>"Procedures for referral and liaison had been established" (p.120). | |

# Appendix C:

# Bibliography

# Bibliography

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